An analysis of the private water provision in Great Britain.

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In 1989 England and Wales transferred their public provision of water to the private sector. This was the largest public to private water transfer ever to have happened in the Western World. The main objective of this study is to determine if there has been a positive or negative impact on provision due to this privatisation and whether this provision can be called effective.

In order to ascertain the effective nature of the provision and to determine whether there has been an improvement or deterioration, six key performance criteria have been devised from the most critical areas in the provision of water. Various forms of information were gathered which include statistics from regulators, corporate providers and secondary sources. In addition a series of elite interviews were carried out which included a variety of stakeholders including; corporate providers, quasi-autonomous non-regulatory organisations, charities and consumer bodies.

This study shows that although the systems in England and Wales have areas which need to be improved, all six of the key performance criteria have improved since privatisation and that the current system of private provision is effective.

Biographical Sketch

Michael James Bowes is a qualified solicitor in both Scotland and England. He obtained his initial law degree (LLB with honours) in 2004 from Glasgow University and completed half of his honours grades at the National University of Singapore. Following this he obtained Diplomas in both Scots and English Law from the Glasgow Graduate School of Law and Nottingham Law School. He also passed his English Transfer Examinations allowing him to practice in England.

Professionally he practised law in a large commercial firm for two years to qualify as a solicitor, subsequently he taught commercial law at Glasgow University for a year. After teaching, he has worked for a variety of institutions ranging from the United Nations, Hedge funds and the Council of Europe.

At Cornell University he obtained a (LLM) Master of Laws degree in (2009) and following enrolled for a Doctorate in Law (JSD), which is the purpose of this submission.

Dedication

Dedicated to

My Parents Mr Jim and Mrs Katrina Bowes.

Their support has been only been exceeded by their love.

My Father is my best friend and my Mother is my hero.

And

My dear Grandmother Mrs M Scott.

Her joy for life is shown in the happiness of those she loves.

"*Every day I wake up and try to make someone happy!*"

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An analysis of the private water provision in Great Britain.

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List of Abbreviations

EA / The Environment Agency

The British Government Agency concerned with pollution and flooding.

http://www.environment-agency.gov.uk/

CCW / The Consumer Council for Water

This body represents the interests of consumers in England and Wales and deals with complaints against water providers.

http://www.ccwater.org.uk/

DEFRA / The Department for the Environment, Food and Rural Affairs

The British Government department concerned with environmental protection.

http://www.DEFRA.gov.uk/

DWI / The Drinking Water Inspectorate

This regulatory body monitors the quality of drinking water provided by the water companies in England and Wales/

DWQR / The Drinking Water Quality Regulator for Scotland

This regulatory body monitors the quality of drinking water provided in Scotland/

http://www.dwqr.org.uk/

NAWC / National Association of Water Companies (USA)

This is an association of private water and sewage providers in the United States of America.

NGO / Non Governmental organisation

Ofwat / The Water Services Regulation Authority

This is the regulator who monitors price in England and Wales.

http://www.ofwat.gov.uk/

Quango / Quasi Autonomous Non-Governmental Organisation

RELU / The Rural Economy and Land Use Programme

This is an academic programme which is focused on the rural economy.

http://www.relu.ac.uk/

UN / The United Nations

WICS / The Water Industry Commission for Scotland

This is the regulator who sets the price for water customers in Scotland.

http://www.watercommission.co.uk/

Chapter 1

Introductory Chapter – Water The Most Important Compound

Introduction

Our Planet is consumed and comprised mostly of water, over two thirds is comprised by liquid water in the seas, over one twentieth is composed of ice and the majority of most living things are comprised primarily of water. As Ball states, "*We call our home Earth, but Water would be more apt*."[1] Water is a unique and irreplaceable resource, which is necessary for life. The adequate provision of water is of paramount importance in any country. Provision comes in many forms, one of which is by private corporations as in England and Wales.

The basic claim of the Thesis is that water provision in England and Wales has improved since the transfer from public to private ownership and that the current private provision can be deemed to be effective. It is the principle focus of this study to scrutinise private provision and in particular the private

[1] Ball P "*Life's Matrix. A Biography of Water "* University of California Press, 2001

provision in England and Wales, to ascertain if there is effective provision in these countries and to determine whether privatisation has had a positive or detrimental impact to this provision. The island of Great Britain is unique in that it has three systems of provision under one head of state (Her Majesty Queen Elizabeth II) in one kingdom, two of those systems are different forms of private provision and England is unique in that it was the western world's largest ever water transfer from public to private provision. In addition the author being British was able to access and interview elite individuals connected with the provision and regulation of water. These combined factors has allowed a work to be produced which gains completely new knowledge into a unique sector of a topic which is globally important.

Part 1 of this chapter begins with highlighting the global problem and international concerns surrounding the adequate provision of drinking water. The importance of the topic is then further illustrated both by discussing water as necessary and irreplaceable to humanity, as a legal human right and also as a commercial product. Part 2 of this chapter introduces private sector provision to the reader, different forms of privatisation are then discussed including the systems in England and Wales. Part 3 highlights the main areas of discussion and their objectives in all of the chapters of the text.

Research Claim and Objectives

The principle claim behind the work is that since privatisation water provision has improved in England and Wales and that the service being provided can be called effective. In order to establish this claim certain objectives have been accomplished and are listed below:

This Thesis will evaluate water provision in Great Britain, with particular focus given to the system of private provision in England and Wales.

The Thesis will first determine to what extent water as a resource and its method of provision is an important area for discussion.

The concept of water as a human right and a commodity will then be considered.

Different systems of water provision in the private sector will be identified and defined, in conjunction with what is and can be termed as private provision.

The methodology used in the analysis is called ‘Elite Interviewing’. This methodology gathers empirical knowledge gained from interviews with elite members of the water industry and combines that information with other primary and secondary sources including statistics. This methodology will be explained and the reasons for its choice justified.

Literature and statistics are interwoven through out the Thesis, this includes a full analysis and discussion of several seminal works. From these works key areas of discussion and concern are highlighted and used later in the Thesis to determine the efficiency of provision of the various systems in Great Britain.

The system in England and Wales will then be introduced by understanding the reasons and method by which the provision changed from Public to Private.

The legislation governing Scotland, England and Wales will be assessed with the aim to understand both European and National restrictions and targets that are placed over the water providers including the restrictions

placed by their regulatory (quasi autonomous non governmental) departments.

What regulatory bodies exist and what they do in order to control the actions of the providers will then be evaluated. How much power over the providers and what their roles are in relation to the providers will be understood and assessed. What is being accomplished successfully and what should be improved will be identified.

The three systems of water provision in Great Britain will be analysed. Both England and Wales have different forms of private provision and Scotland has public provision. The emphasis and focus is on the private systems. This provision will be discussed in detail, with the aim of evaluating its efficiency.

The provision of the service and to what extent it is effective will be determined by separating the provision into key performance criteria. This criteria, was ascertained from studying the principle concerns and focus points of the seminal literature narrated in this text. If effective provision is operational in the elements defined as key performance criteria, these

provisional elements shall be highlighted. If certain elements are lacking, and the provision should be improved, these areas will be discussed.

It will be ascertained if there has been an improvement, or a deterioration in provision since privatisation by studying the various key performance criteria.

Sustainable Development, among other criteria, will be incorporated into the analytical process to determine to what extent the provision has incorporated holistic and environmentally sustainable provision.

The future of water will then be reviewed, as shall possible future threats and solutions. The solutions will incorporate any areas of provision where England and Wales must improve, or if other systems may learn from elements of provision in England and Wales.

The work then highlights the fact that a debate on public or private provision can be distorted by ideology when the focus should be factual and on the best form of provision for all stakeholders.

Limitations of the Work

This work does not intend to determine if private provision should be used universally as opposed to other forms of provision, nor whether the system used in England and Wales should be used or copied instead of other systems. It recognises that each country has different water provision pressures and the goal is not to affirm that one system should be used, or that privatisation should be globally initiated. In relation to legislation this work is an analysis into the effective nature of privatisation and although it discusses where the legislation needs to be improved it is not its overall goal to comprehensively correct the current legislation. In addition, whether water is or should be classed as a human right is discussed, but it is not the purpose of this thesis to make a determination on whether it can legally be called or should be called a human right. As explained in detail later in this chapter the international participation in the human right debate its is used to highlight and validate the importance of the topic.

Principle Argument and Findings

The principle argument is that privatisation has improved provision in England and Wales and that the service being provided can be called effective. The effective nature of provision was analysed by identifying six key performance criteria. Information on these key areas was gathered from first hand interviews with experts, secondary sources and statistics verified by governmental regulators.

The work found that the provision in England and Wales dramatically improved since privatisation in all six areas and it recognises that the system has areas, which need improvement. Since privatisation the private sector has invested a massive amount of capital (around 100 Billion Pounds) and saved the government around the same amount in borrowing costs. The drinking water quality has improved substantially as have environmental issues such as the quality of water in rivers and beaches. Prices have risen since privatisation, but it is estimated by the independent regulator (The Water Services Regulation Authority) that these would be higher if provision were to be provided by the public sector. The systems of

privatisation in England and Wales show that private sector provision can be an effective form of water provision.

Methodology and Literature Used

The Methodology used in this Thesis is called Elite Interviewing. This allows for the collection of empirical information from experts in the field of water. This empirical information is not taken in isolation, but is combined and verified with facts gathered from various sources. In addition to relevant literature being interwoven and referenced in the text, Chapter 2 comments on several seminal works, which discuss the privatisation of water provision.

Part 1

Importance of the Topic

Global Problem

"*There are two roots [of the water problem], one of them is that there is water but there is no access to the water. The other is that there is plenty of access but the resources are not there. So in either circumstance the poor don't have the water – either because they cant afford it or don't have it. Currently 48 countries in the UN have water stress and water scarcity. This will only grow.*"[2] Davies highlights the importance of access to the resource and the infrastructure, which allows effective provision. The problem is simple, not enough freshwater is being provided to those in the world who need it. As a commodity it is becoming increasingly less accessible yet the demand and human necessity is increasing.

[2] Interview with April Davies, Water.Org, See Appendix 1

Water and Human Health

Water is such a common commodity[3] and its availability so widespread that many countries and individuals have forgotten the precious nature of this resource and treated it with indifference.[4] Water scarcity is becoming more prevalent across the world and is caused by a variety of factors[5], which is worrying considering the dependence humanity has on it. Humans are composed primarily of water[6], it is the most essential element in the world. Humanity is completely dependent on the intake of fresh water, without it, humanity would cease, with insufficient amounts humanity is unable to adequately function, indeed 2% de-hydration leads to a 20% loss of human physical capabilities[7]. Our body is comprised of up to around 60% water, in particular vital organs are composed mainly of water, 90% of lungs are comprised of water and 70% of the brain is comprised of water. This water

[3] For Global Water Statistics and an explanation of the Hydrological cycle see Appendix 2 and Appendix 3. For Water statistics related to the United Kingdom see Appendix 4.
[4] Fagan, B "*Elixir: A history of Water and Humankind"* New York Bloomsbury Press, 2001
[5] For examples of factors which cause water scarcity see Appendix 5
[6] Water on average comprises 57% of a man's bodyweight and may exceed 75% in infants. Guyton, A "*Textbook of medical Physiology*" Fifth Edition, 1976
[7] Biuguerra, L "*Water Under Threat*", Zed books, 2003 (Translation 2006)

must be continually replaced, on average 2.4 litres must be consumed in the form of food or drink each day.[8]

It is impossible to provide an exact answer to the question; 'How long can one survive without water?' This apparently simple question may be influenced by an infinite number of variables, which would determine the survival time. These include, but are not restricted to : Age, Health, Shelter, Level of Hydration and Availability of Food. For example in an extreme situation of a small child being abandoned in a hot car, or in the case of a severely dehydrated individual in inclement terrain, death may take several hours. Contrastingly a healthy adult in a sheltered environment may survive over a week without water[9]. What can be ascertained is that the amount is not an exact science, but the need for provision is a certainty.

Water must be provided and when it is provided it must be clean. Unclean water is the biggest cause of death and disease around the world. Over two million deaths per year are attributed to unclean water, sanitation and

[8] United States Geological Information (USGS): (http://ga.water.usgs.gov/edu/propertyyou.html)
[9] Packer R, "*How Long Can the Average Person Survive Without Water?*" Scientific American, December 9 2002.

hygiene[10]. Water is and has been the cause of death through disease and conflict[11], but superseding all death, it is the provider of life. Water must be managed efficiently and equitably to enable the optimum benefit for life, which it enables. Privatisation is one method of management and is the focus of this Thesis.

The Global Importance of Water

"We used to think that energy and water would be the critical issues for the next century. Now we think water will be the critical issue.[12]"

Water is undeniably the most important compound in the world and is seen by many countries and organisations as the critical issue for the future. Whether water should be perceived as a commodity, a resource or a human right, it is and always will be a prerequisite to life. It is an international and universal necessity and is at the forefront of national and international

[10] The World Health Organisation (http://www.who.int/water_sanitation_health/facts_figures/en/index.html)
[11] There have been over 200 conflicts over fresh water as documented by the Pacific Institute (http://www.worldwater.org/conflict/list/)
[12]Mostafa Tolba of Egypt, former head of the United Nations Environment Program: One Water (http://www.onewater.org/education/curriculum/ch12)

discussion. The United Nations is an example of where water has been duly given its standing as an area which demands attention and immediate action.

The United Nations Millennium Declaration was adopted in September 2000. This declaration was the culmination of years of international collaboration and aspired to set a series of international targets, which would benefit humanity.[13] Water was raised in two (sub) clauses of the Declaration:

"*We resolve further: To half, by the year 2015, the proportion of the world's people whose income is less than one dollar a day and the proportion of people who suffer from hunger and, by the same date, to half the proportion of people who are unable to reach or to afford safe drinking water*." (Clause 19)

"*We resolve therefore to adopt in all our environmental actions a new ethic of conservation and stewardship and, as first steps, we resolve: To stop the unsustainable exploitation of water resources by developing water management strategies at the regional, national and local levels, which promote both equitable access and adequate supplies.*" (Clause 23)

[13] United Nations Millennium Declaration, September 18, 2000. http://www.un.org/millennium/declaration/ares552e.pdf

As shown it is a United Nations Millennium Goal to half the number of people without basic sanitation access by 2015. If these water goals were achieved, of the 2.6 Billion without access at least 1.7 Billion would be equipped with decent facilities, but due to donor countries diverting money from water projects this (on current projection) shall reduce to 700 million. The aid which has been given to water projects, has shrunk as a percentage of global financial aid from around 8% to 5%. Aid in the form of clean water and sanitation is estimated to be one of the most cost effective ways to provide aid. It is estimated that for every $1 spent $9 is returned due to an improvement in health and thus economic activity.[14] Investing 0.16% of the global GDP ($198Billion per year) would provide half a Billion people with access to safe drinking water within four years.[15]

The good intentions which were present in the drafting and signing of the Development Goals, have not been backed with as much action as is needed to satisfy the targets, which is worrying considering that the water provision

[14] "*Millennium goal in jeopardy as donors shun water projects*." The Guardian, 28 June 2011
[15] "*UN Plea to avert water shortage*.' The Independent, 27 August, 2011
[15] See also United Nations '*Green Economy Repor*t', 2011: http://www.unep.org/greeneconomy/Portals/88/documents/ger/ger_final_dec_2011/4.0-WAT-Water.pdf)

was and is seen as an international crisis. "*The word crisis is sometimes overused in development. But when it comes to water there is a growing recognition that the world faces a crisis that, left unchecked, will derail progress towards the Millennium Development Goals and hold back human development.*" United Nations Human Development Report.[16] Not only is the international community failing to resolve the global water crisis, but it is worsening at an increasingly rapid rate. These ecologically unsound acts will only be to the determent of future generations. It should be noted that the number of people living in water stressed countries will increase from around 700 million today to more than 3 Billion by 2025. Over 1.4 Billion people currently live in river basins where the use of water exceeds minimum recharge levels. Water shortage threatens to increase malnutrition by 75 – 125 million people by 2080.[17]

Even if the Millennium Goals were to be satisfied a large proportion of the world's population would still be without clean water and sanitation. "*Clean water and sanitation would save the lives of the countless children, support progress in education and liberate people from the illness that keeps them in poverty. The urgency of achieving the Millennium Development Goal for*

[16] United Nations Human Development Report, "*Beyond Scarcity*" 2006,
[17] United Nations Human Development Report, "*Beyond Scarcity*" 2006,

water and sanitation cannot be overstated. Even if the targets are achieved there will still be more than 800 million people without water and 1.8 Billion people without sanitation in 2015[18]*".*

Human progress is interdependent with the provision of clean water, sanitation services and wastewater removal. *"Today some 1.1 Billion people in developing countries have inadequate access to water, and 2.6 Billion lack basic sanitation (one out of every two people)*."[19] It is estimated that 69% of world fresh water is used for irrigation, with 15 – 35% of all irrigation withdrawals being unsustainable.[20] Water cannot be divided and supplied trans-nationally in the way that other commodities are and the way in which water is used or abused in one region directly affects the water supply and quality of other regions. In addition to this, land masses such as the United Kingdom (which are renowned for its plentiful rainfall) may be damaged by restricted rainfall in other countries due to the constraint in supply of water intensive imports. Indeed two thirds of the water used to make UK imports is used outside its borders.[21] "*The burgeoning demand*

[18] United Nations Human Development Report, "*Beyond Scarcity"* 2006,
[19] United Nations Human Development Report, "*Beyond Scarcity"* 2006,
[20] Kibona, D, et al "*Environment, Climate Warming and Water Management*" Transit Stud Review 16 (484-500), June, 2009
[21] Black, Richard "UK Water Use worsening Global Crisis" BBC, April 2010, (http://news.bbc.co.uk/2/hi/8628832.stm)

from developed countries is putting severe pressure on areas that are already short of water … If the water crisis becomes critical, it will pose a serious threat to the UK's future development because of the impact it would have on our access to vital resources." Professor Guthrie, Centre for Sustainable Development at Cambridge University. [22]

Nationally and internationally, adequate water provision is seen as an unquestioned area of deep concern. Its importance has been raised by international bodies such as the United Nations and a topic for debate around the globe. Water has reached such a level of importance that there is a strong and polarised debate on whether it is or indeed should be a human right, such a debate again illustrates the importance of the issue of water provision.

The Importance of Water as a Human Right and a Commodity

The object of this work is not to determine whether water should be classed as a human right, but the importance of the debate illustrates the importance of water and the need for its provision to be discussed. Academic thought on

[22] Black, Richard "UK Water Use worsening Global Crisis" BBC, April 2010, (http://news.bbc.co.uk/2/hi/8628832.stm)

the topic of water as a human right is polarised and a full discussion warrants considerable time and research. The fact that water is being debated as a possible human right and has been in certain international legal documents stated directly and indirectly as a right, proves that the topic of water and its supply merits consideration and highlights its importance. Water is a critical substance, indeed it is so critical that some believe that it should be classed as a human right. This debate isolates water into a minority of those items, which are debated as being considered valuable enough to humanity to be classed as a right. This Thesis will not engage in a legal debate as to the final determination of water as a right. It will however show that certain international legal instruments, drafted by renowned international organisations such as the United Nations, have been constructed to address the provision of water and in certain instances state that it is a human right. The fact that such international institutions regard water worthy of international treaties and in certain instances as a human right, validates the fact that water is important enough for academic consideration and in particular the methods of its provision, including private provision.

Water is classed by some, as an economic commodity. The concept of such a valuable resource being termed in a commercial way is also a volatile topic of debate in which there is a great disparity of opinions. This Thesis will not determine whether water should or should not be classed as a commodity, but it shall show how the provision and transfer of water is being done commercially and is regarded as a highly valuable asset. Such a valuable asset in terms of it being a possible human right or an item by which there are huge possible financial gains demonstrates that water is not only an issue of morality, but of finance and thus illustrates its importance in another arena. As the Economist illustrates, commodity or human right, water is by its essential characteristic, the most important item because it is both necessary and without substitute: "*People kill each other over diamonds; countries go to war over oil. But the world's most expensive commodities are worth nothing in the absence of water. Fresh water is essential for life, with no substitute. Although mostly un priced, it is the most valuable stuff in the world.*" [23]

[23] "*The World's Most Valuable Stuff*" The Economist May 20th 2010: http://www.economist.com/node/16163366?story_id=16163366

Water as a Human Right

Water as a human right has been promoted around the world by various institutions and individuals as the first step in resolving the water problem. This is however a more sophisticated question than one would initially consider it to be and involves considering obligations deriving from that right and possible future conflict that may occur in international basin sharing. Currently there are no international laws, which impose a right to water. The debate about whether this should be a moral necessity or onerous and unenforceable shall continue for the foreseeable future and indeed this is a debate with considerable merit. Many academics believe that considerable time and money has been wasted pondering over not only if water should be considered a right but the nuance of the possible language if it were to be made so and so withering away time on a debate as opposed to resolving a water crisis. "*Welfare of the people is in practice the purpose of social rights. However, it may be argued that an undue current focus on human*

rights loses sight of our primary responsibility to protect the health and welfare of the people."[24]

The analysis of the efficient and equitable provision of water is of indubitable importance to humanity. Regardless of whether water should be considered as a right is secondary only to adequate provision. If there is a subjective belief in Human Rights as a concept then it would be difficult to argue that water was not the foremost human right (or possibly second to the right of oxygen), for without water and the right to it, all other rights are superfluous, whether it legally is however is an ongoing debate.

International Debate on the Human Right

"*The United Nations has clearly stated in its Millennium Goals that by 2015 the number of people unable to reach or afford safe drinking water and basic sanitation should be halved*[25]*. Water is clearly of International import and the progression of its availability critical to the progression of humanity. Certain questions must however be addressed in relation to its*

[24] Porter, Keith "*The Right to Have Water or an Obligationn to Provide it*?" Article published in "*Losing Paradise*" edited by Holst Warhaft, Gail, Ashgate Publishing, 2010
[25] United Nations Millennium Goal 7 C: (http://www.un.org/millenniumgoals/environ.shtml)

treatment as a legal right. Firstly what must be established is does the right to water have legal standing."[26]

The question which Scanlon raises, in relation to water as a right in the global legal context is the most important. It was noted in the early 90s that although there had been much academic and political discussion on the right to health and the entitlement to food that astonishingly little focus had been on the right to water.[27] In the past 20 years considerable more focus has been given to water and indeed water as a legal right.

The World Water Council is one organisation promoting the Right To Water. It highlights that not only is it intrinsic to a variety of other rights, but in isolation the right to water is '*indispensable for leading a life in human dignity*.'[28]

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[26] Scanlon J, et al, "*Water as a Human Right"* IUCN Environmental Law Programme, 2004, (see also Porter, Keith " The Right to Have Water or an Obligatoin to Provide it? Article published in " Losing Paradise" edited by Holst Warhaft, Gail, Ashgate Publishing, 2010)
[27] McCaffrey S "*A Human Right to Water: Domestic and International Implications"* International Environmental Law Review 1(1992-1993)
[28] World Water Council: (http://www.worldwatercouncil.org/index.php?id=1764#c9508)

Water is clearly of international import and the progression of its availability critical to the progression of humanity. Certain questions must however be addressed in relation to its treatment as a legal right. Firstly what must be established is does the right to water have international legal standing.

UN Charter

The United Nations Charter of 1945[29] makes no mention of the right to any form of water. Water is not mentioned in any Article of the Charter. Article 55 states that the United Nations shall 'promote' various conditions which one could argue would be impossible without access to safe water (and sanitation) including: (a) '*higher standards of living…conditions of economic and social progress and development*.' (b) '*solutions of international economic, social, health and related problems*.'[30]

[29] Charter of the United Nations, adopted 26 June 1945, entered into force 24 October 1945.
(http://treaties.un.org/doc/Publication/CTC/uncharter.pdf)
[30] Charter of the United Nations 1945 Article 55 Section A and Section B

Declaration of Human Rights

In 1948 the General Assembly of the United Nations adopted the Universal Declaration on Human Rights.[31] This Declaration is not legally binding to its signatories, but it is regarded by many as persuasive in legal process and has been given political and legal standing at an international level. The Declaration is similar to the Charter of 1945 that it does not state that there is a right to water, nor is water mentioned in the document. Food is mentioned once in the declaration and water is needed for any food and thus indirectly water can be seen as a right through Article 25.[32]

Geneva Convention

The Geneva Conventions are reputed to be the '*Cornerstone in international humanitarian law*'[33] They comprise four Treaties and three additional

[31] The Universal Declaration on Human Rights, 1948: (http://www.un.org/en/documents/udhr/)
[32] Article 25 "*Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control*."
[33] Dormann K," The Geneva Conventions Today" (head of Legal Division of the Red Cross) Statement on 9 July 2009:

Protocols that state basic expectations, obligations and rights of humans during war and were initiated during the aftermath of World War II.

The Geneva Conventions and Protocols do explicitly state there is an obligation to provide potable water. This obligation to provide water covers drinking water and water for sanitation. It encompasses every stage of the prisoner's captivity from evacuation to custody and transportation. Article 20 of the Geneva Convention III[34] states for example "*The Detaining Power shall supply prisoners of war who are being evacuated with sufficient food and potable water, and with the necessary clothing and medical attention*. In addition Article 26 states "*Sufficient drinking water shall be supplied to prisoners of war*. Water for the use of sanitation in addition to drinking water is also stated as an obligatory provision. Article 29 states, "*Apart from the baths and showers with which the camps[35] shall be furnished prisoners of war shall be provided with sufficient water and soap for their personal toilet and for washing their personal laundry; the necessary installations, facilities and time shall be granted them for that purpose*." Comprehensively

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(http://www.icrc.org/eng/resources/documents/statement/geneva-conventions-statement-090709.htm)

[34] Convention III relative to the treatment of Prisoners of War. Geneva 12 1949: (http://www.icrc.org/ihl.nsf/FULL/375?OpenDocument)

[35] (Detainee / Prisoner of War Camps and Prisons)

the Convention also states that water must be provided in transporting any prisoners in Article 46; "*The Detaining Power shall supply prisoners of war during transfer with sufficient food and drinking water to keep them in good health, likewise with the necessary clothing, shelter and medical attention.*"

The Geneva Convention IV[36] (Articles 85, 89 and 127), Additional Protocol I[37] (Articles 54 and 55) and Additional Protocol II[38] (Articles 5 and 14) also state obligations to provide water. Although explicit in the documents to provide water these documents are binding during times of conflict and to those in the conflict.

International Covenant on Civil and Political Rights

[36] Convention (IV) relative to the Protection of Civilian Persons in Time of War. Geneva, 12 August 1949:
(http://www.icrc.org/ihl.nsf/FULL/380?OpenDocument)
[37] Protocol additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), 8 June 1977:
(http://www.icrc.org/ihl.nsf/FULL/470?OpenDocument)
[38] Protocol additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of Non-International Armed Conflicts (Protocol II), 8 June 1977:
(http://www.icrc.org/ihl.nsf/FULL/475?OpenDocument)

The International Covenant on Civil and Political Rights[39] was adopted by the UN on 16 December 1966 and was brought into force from March 23 1976. It obligates its signing parties to respect a variety of rights including civil and political rights, speech, religion, assembly and importantly life. Article 6 Stating; "*Every human being has the inherent right to life. This right shall be protected by law. No one shall be arbitrarily deprived of his life. "*

General Comment No 15

"*Water is fundamental for life and health. The human right to water is indispensable for leading a healthy life in human dignity. It is a pre-requisite to the realization of all other human rights... The human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses. An adequate amount of safe water is necessary to prevent death from dehydration, to reduce the*

[39]International Covenant on Civil and Political Rights, adopted and opened in December 1966:
(http://www2.ohchr.org/english/law/pdf/ccpr.pdf)

risk of water-related disease and to provide for consumption, cooking, personal and domestic hygienic requirements."[4041]

This statement was issued in connection with the International Covenant on Economic, Social and Cultural Rights (as described above) in January of 2003. By Issuing this statement the United Nations Committee on Economic Social and Cultural Rights[42] made a clear indication that water should be considered as a human right. Indeed some organisations such as the World Health Organisation have stated that such a statement has now obligated the countries, which have ratified the Covenant to ensure that individuals in those countries have access to safe drinking water and sanitation facilities.[43] This has not however been agreed by those countries.

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[40] "*The Right to Water*" United Nations Office of the High Commissioner for Human Rights. General Comment No 15:
(http://www.unhcr.org/cgi-bin/texis/vtx/refworld/rwmain?page=search&docid=4538838d11&skip=0&advsearch=y&process=y&allwords=comment%2015&exactphrase=&atleastone=&without=&title=&monthfrom=01&yearfrom=2003&monthto=01&yearto=2003&coa=&language=&citation=)

[41] The United Nations Committee on Economic, Cultural and Social Rights, Environment News Service, 27 November 2002:
(http://www.who.int/mediacentre/news/releases/pr91/en/)

[42] The United Nations Committee on Economic Social and Cultural Rights represent the International Covenant on Economic Social and Cultural Rights and is comprised of independent experts who are tasked with monitoring the implementation of the Covenant:
(http://www2.ohchr.org/english/bodies/cescr/)

[43] "Water for Health Enshrined as a Human Right" WHO Media Information Page:
http://www.who.int/mediacentre/news/releases/pr91/en/)

In addition to the above international documents there are also other important global environmental instruments, several of which are described below:

Stockholm Declaration

The Declaration of the United Nations Conference on the Human Environment or commonly known as the Stockholm Declaration due to the location of the meeting is commonly regarded as the first International Treaty focused on the environment. Water as a right to individuals is not stated. Water as an important natural resource is highlighted in Principle 2.

Principle 2 States "*The natural resources of the earth, including the air, water, land, flora and fauna and especially representative samples of natural ecosystems, must be safeguarded for the benefit of present and*

future generations through careful planning or management, as appropriate."[44]

Mar Del Plata Action Plan

The United Nations Water Conference Held in 1977, in Mar Del Plata recognised water as a "Right" in the Preamble to the conference.[45] The 1977 Action Plan was an internationally recognised benchmark to the global community recognising the importance of water and the future problems with water and has continued to be a source of discussion.[46] This conference was supposed to launch the International Water and Sanitation Decade (1980-90) but in that decade no legally binding international water provision agreements were ratified.

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[44] Declaration of the United Nations Conference on the Human Environment June 1972 (Principle 2): (http://www.unep.org/Documents.Multilingual/Default.asp?documentid=97&articleid=1503)

[45] Preamble, United Nations. (1977). Report of the United Nations Water Conference, Mar Del Plata. March 14–25, 1997. No E 77 II A 12, United Nations Publications, New York.

[46] For further reading on see the "*Mar Del Plata 20 Year Anniversary Seminar*" Document, Stockholm International Water Institute, August 1997: (http://www.siwi.org/documents/Resources/Reports/Report1_Mar_del_Plata_1997.pdf)

Dublin Statement

The International Conference on Water and the Environment was held in Dublin from 26 to 31 January 1992. The Dublin Statement[47] was a meeting of various experts on water and water related issues. The aim was to discuss various global water issues and to construct various 'Principle', now referred to as the Dublin Principles, which highlight the value of water and recommend ways in which its use should be managed. Many Countries and organisations contributed to the Conference including the United Kingdom.

The Dublin Statement on Water and Sustainable Development[48] outlined four principles, which have since become the pillars of Integrated Water Resource Management these are:

"*Principle No. 1 - Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment.*

[47] (http://docs.watsan.net/Scanned_PDF_Files/Class_Code_7_Conference/71-ICWE92-9739.pdf)
(http://www2.ohchr.org/english/bodies/HRTD/docs/DublinStatement.pdf)
[48] The Dublin Statement on Water and Sustainable Development, Dublin Ireland, January 31 1992:
(http://www.inpim.org/files/Documents/DublinStatmt.pdf)

Principle No. 2 - Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels.

Principle No. 3 - Women play a central part in the provision, management and safeguarding of water.

Principle No. 4 - Water has an economic value in all its competing uses and should be recognized as an economic good."

Before General Comment Number 15, Principle Number 4 of the Dublin Principles was seen as the closest form of international recognition that water was a right:

"*Principle No. 4—Water has an economic value in all its competing uses and should be recognized as an economic good.…*

Within this principle, it is vital to recognize first the basic right of all human beings to have access to clean water and sanitation at an affordable price. Past failure to recognise the economic value of water has led to wasteful and environmentally damaging uses of the resource. Managing water as an economic good is an important way of achieving efficient and equitable use,

and of encouraging conservation and protection of water resources."

Agenda 21

Agenda 21[49] was the product of the United Nations Conference on the Environment and Development and it was held in Rio di Janeiro, Brazil in 1992. In total 178 governments adopted the text[50], however implementation of the text remains voluntary. Section II Paragraph 18, states that all people have a right to an adequate quality and quantity of water. It also suggests that various activities to save water be implemented, these range from the promotion of appropriate technologies[51] to the promotion of waste water reuse, in agriculture[52].

Other International and Continental declarations and documents including: the Millennium Declaration[53], the Report of the World Summit on

[49] The number 21 relates to the 21st Century.
[50] Agenda 21 Text:
(http://www.un.org/esa/dsd/agenda21/res_agenda21_00.shtml)
[51] 18.76 A
[52] 18.76 F
[53] The Millennium Declaration :

Sustainable Development,[54] the Convention on the Elimination of All forms of Discrimination against Women[55] and the Convention on the Rights of the Child (1989)[56] highlight the water crisis and resolve to try and ease water shortage.

Although the aforementioned Treaties and Resolutions have been ratified by a plethora of countries, at an international level there still remains a void in legislation, which is clearly accepted to provide nationals a right to water both at a national and international level.

(http://www.un.org/millennium/declaration/ares552e.htm)
Water is mentioned in Section 3 Paragraph 19 Where it was resolved to '*To halve, by the year 2015, the proportion of the world's people whose income is less than one dollar a day and the proportion of people who suffer from hunger and, by the same date, to halve the proportion of people who are unable to reach or to afford safe drinking water*.
and Section 4 Paragraph 22 where it was resolved to "*To stop the unsustainable exploitation of water resources by developing water management strategies at the regional, national and local levels, which promote both equitable access and adequate supplies*."

[54] Report of the Summit on Sustainable Development, Johannesburg, South Africa, 26 August – 4 September 2002:
(http://www.johannesburgsummit.org/html/documents/summit_docs/131302_wssd_report_reissued.pdf)

[55] Article 14 States that there is a right to"*To enjoy adequate living conditions, particularly in relation to housing, sanitation, electricity and water supply, transport and communications.":*
(http://www.un.org/womenwatch/daw/cedaw/text/econvention.htm)

[56] Convention on the Rights of the Child, Ratified on 20 November 1989 and came into force on 2 September 1990. Article 24 states (*Every state shall take appropriate measures to* "To combat disease and malnutrition, including within the framework of primary health care, through, inter alia, the application of readily available technology and through the provision of adequate nutritious foods and clean drinking-water, taking into consideration the dangers and risks of environmental pollution":
(http://www2.ohchr.org/english/law/crc.htm)

"*To date international law has escaped this moral duty because the human right to water is not yet treated as a legally enforceable obligation. Some scholars have suggested that international law has not explicitly recognised a binding human right to water because any such right would be unenforceable."*[57]

At a national and supranational level the provision of water is regarded as a legal right along with its provision. This can be shown in Britain with its incorporation of both European and national legislation.

Britain and Europe

In British legislation[58] the providers[59] are legally obliged to provide water to domestic users and the right of the individual to be provided with this water is dealt with through this legislation. It should be noted that in the event of

[57] *Porter, Keith. "Chapter 4 Losing Paradise: The Right to Have Water: Or an Obligation to Provide it? " Edited by Gail Holst-Warhaft and Tammo Steenhuis, Ashgate Publishing Company, 2010.*
[58] The legislation covering European and British provision shall be discussed in detail later in the Thesis.
[59] For example Scottish Water in Scotland and the other water providers (water only and water and sewage) for England and Wales.

non payment, any provider is prohibited from disconnecting any domestic user and is forced to find financial redress through other means.

At a European level the European Council of Environmental Law adopted a resolution in 2000 on the right to water.[60] In this Resolution it states both that water is a right and that each individual has that right.[61]

"The human right to water does exist, as water is the most essential element of life. However, as the overview of the present instruments indicated, this right has not been clearly defined in international law and has not been expressly recognized as a fundamental human right. Rather, a right to water is interpreted as being an implicit component of either existing fundamental human rights, or is expressly included in non-binding instruments that are designed to achieve specific ends"[62] As previously highlighted it is not within the desired purpose of this Thesis to determine whether water is an

[60] ECEL Resolution, Adopted on 28 April 2000, Environmental Policy and Law 30/5 (2000)
[61] "*Observations on The Right to Water as a Human Right*" Written Statement Submitted by the International Council of Environmental Law (UN Economic and Social Council) on 7 August 2000: http://www.unhchr.ch/Huridocda/Huridoca.nsf/0/cc44adbac8d8c3c2c125694c00520ba6?Opendocument
[62] Scanlon J et al "*Water as a Human Right*" IUCN Environmental Law Programme, IUCN Environmental Policy and Law paper No 51 (http://ibcperu.org/doc/isis/11856.pdf)

international human right, it is however important to highlight the debate and thus the importance of the topic. Some would argue that water is not a human right but a commodity, the exclusion of one would not prohibit the existence of the other.

The importance of water as a commodity

Water as an Economic Commodity

"*Water is a unique commodity because nothing else can substitute for it. Indeed, nothing is as universal, and as necessary, as water. Because it's needed for virtually everything we produce and consume, its availability and its price, are crucial to the global economy and to the livelihood of the world's population*."[63]

Forbes has no hesitation in claiming that water is not only a commodity but one which is completely unique. If a commodity is something that is purchased and sold then Water is a commodity in the literal sense[64]. Whether

[63] "Water a precious commodity" Forbes 12 December 2011: (http://www.forbes.com/sites/greggfisher/2011/12/12/water-a-precious-commodity-2/)
[64] The commodity of bottled water is discussed in length in Appendix 6.

it should be bought or sold, privately or publicly, is a separate issue. This work seeks not to define water as either a commodity or a legal human right if one of those classifications would be to the exclusion of the other, it highlights the facts that some class it as a legal human right, some a commodity and some both. All views and classifications highlight the importance of the debate and the provision of the substance.

At present water is a global product for national and international markets. There are now even Water indexes including; The Palisades Water Index, The Dow Jones US Water Index, The ISE-B&S Water Index and the S&P Water Utilities Index[65]. Now across the world and in Britain water and its economic value can be given a cost, not only in an index but of actual value which can relate to individual customers:

[65] Palisades Water Index - This index was designed to track the performance of companies involved in the global water industry, including pump and filter manufacturers, water utilities and irrigation equipment manufacturers.
Dow Jones U.S. Water Index - Composed of approximately 23 stocks
ISE-B&S Water Index - Launched in January 2006, this index represents water distribution, water filtration, flow technology and other companies that specialize in water-related solutions.
S&P 1500 Water Utilities Index - A sub-sector of the Standard & Poor's 1500 Utilities Index, this index is composed of just two companies, American States Water and Aqua America

Domestic Water Use and Cost in England And Wales[66]

Table 1

Example Costs of Domestic Water

USE	LITRES	COST
Bath	80 Per Bath	15p
Flushing Toilet	8 Per Flush	1.52p
Power Shower	80 Per Shower	15p
Washing Machine	65 Per Wash	12p
Dishwasher	25 Per Cycle (wash)	5p
Watering the Garden	540 (on average)	103p
Washing Car with Bucket	8 Per Bucket – 32 In Total	6p

One way in which this cost can be seen is through consumption not only of water, but of food. The commodity of food, has a direct correlation to the 'commodity' price of the water which is essential in its production this is

[66] Figures are based on an average cost per litre of 0.19 pence – as used in '*Water, Water Nowhere*' The Independent, Tuesday 21 February 2012

called virtual water.

Water Food Production and Virtual Water

Regardless of the semantics used to describe water, its use and availability have an impact on the economy primarily through its essential use in the production of food. Even Britain is affected by the shortage of available water. In 2012 there was an official drought declared in many areas in the south of England, it is so severe in some areas that even the fish have had to be rescued.[67] This drought is not economically isolated and the entire Kingdom was predicted to and did suffer increased prices in many consumables. "*Lee Morris of the Institute of Horticulture warned that growers using glass houses with irrigation would probably have to pay more for their water. . . Higher vegetable prices are only one likely consequence of the drought – brewers are being affected too, according to David Wilson of the British Beer and Pub Association. He said higher prices for barley and hops would be likely if the drought continued and yields fell, and this increase in costs could be passed on to consumer in the form of a few pence*

[67]"*Who, What, Why: How do you rescue fish?*" BBC News, 6 March 2012: http://www.bbc.co.uk/news/magazine-17212119

extra on a pint."[68] The correlation between production of items, which require water, the amount they require and the cost needed for the requirement is called Virtual Water.

Less commonly known or discussed than the now infamous Carbon Footprint (which measures the total greenhouse gas emissions caused directly and indirectly by a person, company or a product)[69] is the Water Footprint. A Nation's Water Footprint was originally defined as; "*The total amount of water that is used to produce the goods and services consumed by the inhabitants of a Nation"*[70]. Considerable research has been done to determine how much of a Water Footprint different commodities have such as cotton[71] and water in itself is now seen as a 'virtual' water trade.

Water is not only traded in its liquid form but in a variety of ways. This commodity transfer, has been christened by Professor Allan, as the virtual

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[68] "*Food Prices to soar as drought hits key crops."* The Observer 26 February 2012
[69] Widemann and Minx, " *A Definition of Carbon Footprint*" ISA Research Report June 23007 http://www.censa.org.uk/docs/ISA-UK_Report_07-01_carbon_footprint.pdf - see also http://www.carbontrust.co.uk/cut-carbon-reduce-costs/calculate/carbon-footprinting/pages/carbon-footprinting.aspx
[70] Chapagain, Hoekstra, "*Virtual Water Flows Between Nations in Relation to Trade in Livestock and Livestock Products*." UNESCO, August 2003
[71] Chapagin et al, " *The water footprint of cotton consumption: An assessment of the impact of worldwide consumption of cotton products on the water resources in the cotton producing countries* " Ecological Economics 60 (2006) : http://www.waterfootprint.org/Reports/Chapagain_et_al_2006_cotton.pdf

water trade, a concept which later gained him the Stockholm Water Prize in 2008.[72]

Table 2

Virtual Water Content of Consumer Goods[73]

Product	Virtual Water Content (litres)
1 glass of beer (250 ml)	75
1 glass of milk (200ml)	200
1 cup of coffee (125 ml)	140
1 cup of tea (250 ml)	35
1 slice of bread	40
1 slice of bread (30 g) with cheese (10g)	90
1 potato (100g)	25
1 apple (100g)	70

[72] Stockholm International Water Institute: http://www.siwi.org/sa/node.asp?node=25

[73] Information taken from, Chapagain A, et al "*Water Footprints of Nations*" UNESCO IHE, Water Education Institute, Value of Water Research Report Series Number 16, 2004: (http://www.waterfootprint.org/Reports/Report16Vol1.pdf)

1 cotton t shirt (medium size 500g)	4100
1 sheet of A4 paper (80g)	10
1 hamburger (150g)	2400
1 pair of bovine leather shoes	8000

The water footprint of countries varies dramatically.[74]

"*Some countries with a high gross national income per capita can have a relatively low water footprint due to favourable climatic conditions for crop production, such as the United Kingdom (1245 m3*[75]*/yr/cap), the Netherlands (1220 m3/yr/cap), Denmark (1440 m3/yr/cap) and Australia (1390 m3/yr/cap). Some countries can exhibit a high water footprint because of high meat proportions in the diet of the people and high consumption of industrial products, such as the USA (2480 m3/yr/cap) and Canada (2050 m3/yr/cap)… International water dependency is substantial. An estimated 16% of the global water use is not for producing domestically consumed*

[74] Full Water Footprints can be seen at a National Level at: (http://www.waterfootprint.org/?page=files/WaterStat-NationalWaterFootprints)
[75] One Cubic meter is equal to exactly 1,000 litres of water.

products but products for export. With increasing globalisation of trade, global water interdependencies are likely to increase."

60 % of the virtual water trade is from vegetable products, the remaining 40% are shared almost equally by animal products, meat, fish and sea food. Cereals account for 20%, sugar for 6% and oil for 15%, oil crops for 13%.[76]

This constant export over the past few decades has created an international inter-dependency on the goods and therefore the water of other countries, creating an intrinsic link between the health and sustainability of one nation and the water supply of another nation. This trade creates an opportunity to spread the global water wealth by exporting products, which are water intensive to produce, from those countries which have an abundance of water to other countries with low water productivity. This equitable opportunity is not always the reality and exacerbates the disparity even further when water intense products are sold by countries, with little water resources to those who have a plentiful supply. The full implications of this

[76] Zimmer, D. and Renault, D., 2003. "*Virtual water in food production and global trade*": Review of methodological issues and preliminary results. In: A.Y. Hoekstra, ed. Virtual water trade: proceedings of the International Expert Meeting on Virtual Water Trade, Value of Water Research Report Series No. 12. Delft, the Netherlands: UNESCO-IHE, 93–109:
(http://www.fao.org/nr/water/docs/VirtualWater_article_DZDR.pdf)

trade at an international and a national level have not fully been considered and if not considered it may further mitigate the global water problem, which would lead to other serious issues.[77]

One prolific example is the mass export of asparagus from Peru to Western countries has and is causing water stress in a region where without such an export there would be a water abundance. As the demand in the west for a previously deemed seasonal product has increased, asparagus is now considered a staple product, which can be purchased all year round. Industrial production of asparagus in Peru has depleted certain agricultural areas of water to such an extent that farmers and families have to cope with their wells running dry. In essence a luxury item's water footprint is so great that some Peruvian villages only receive water for one hour three times per week. America is the largest importer and annually imports around 174 Million pounds (lbs), which in terms of a water footprint and a virtual water value it is enough water to fill 37,200 olympic sized swimming pools.[78] Now Britain is the third largest importer, consuming 6.5 million kilos per year.[79]

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[77] Chapagain A and Hoekstra A "*The global component of freshwater demand and supply: an assessment of virtual water flows between nations as a result of trade in agricultural and industrial products*" Water International, Volume 33 No 1 March 2008, 19-32.

[78] Garber, C "*Peru's Asparagus Boom Threatening Peru's Water Table*" The World, January 23, 2012:

One area which must be discussed is the concept of bottled water unlike the hidden commercial nature of water in food the transferable visible nature of bottled water must be highlighted. For the critics stating that water is not a commodity it is difficult for one to ascertain how, at least in isolation, bottles of water which are globally purchased and sold on a daily basis, cannot be seen as some form of commodity. For more information on Bottled water see Appendix 6.

The Commodity in Britain

The commodity of water in Britain has several facets, which must be considered: National and International Ownership and Control, Investment and Profit.

(http://www.theworld.org/2012/01/peru-asparagus-water-troubles/)

[79] "*How Peru's wells are being sucked dry by British Love of asparagus* " The Guardian Wednesday 15 September 2010

International Ownership and Control

Eleven water providers are now owned not by British investors or even British Companies but are owned by foreign investors located in six countries including: Australia, France, China (Hong Kong), Malaysia, United States and Spain.[80] This poses interesting questions in relation to the fact that international interests have national control of the most important resource in Britain. What must be remembered is that although international interests are entitled to the provision and profit related to the water of a certain region this is safeguarded by two factors. Firstly Ofwat the regulator has the power to remove the power of any provider during the review process, as shall be discussed later. In addition if there was ever a need for immediate legislation to strip one provider of any form of control this could be done through the British Parliamentary system. The concept of a foreign interest in the water system may seem precarious but the practical nature of any corporation or indeed institution holding the country to ransom over water is implausible considering that it is the ownership of the provision that each provider controls and indeed not the water, in addition to which the right to provide can be removed.

[80] See Appendix 9

Investment

As an investment the British water companies have been solid and outperformed many other utilities and indexes. There are currently four publicly traded water companies for the investor these have been extremely profitable. Profits have range from the period between 2004 – 2012 from Severn Trent 36% (increase in stock/share price) to Pennon which had an increase in 196%.[81]

Profit

The companies have in addition to an increasing stock price seen a steady increase in their profitability. In 2011 United Utilities posted an impressive £596.4 Million profit (before tax). The profitability of the sector was also seen in other publicly listed water companies with Pennon posting a profit of £188.5 million profit and Severn Trent a £253 million profit.[82]

With such high profitability more and more providers are being taken from

[81] See Appendix 10
[82] See Appendix 11

the public markets into private companies, the most recent of which was Northumbrian Water, which posted a pre tax profit of £181 million.[83] It should however be noted that whether the company is public or private does not have an impact on the responsibilities of the provider to the consumer.

[83] See Appendix 12

Part 2

Introducing Private Sector Provision

The provision of water is essential to human life and it is therefore of fundamental importance that the provision of water be monitored and assessed. There are various ways in which the provision of water (and sewage services) can be administered the two systems are either public provision or private provision in their varying degrees and forms.

The popularity of private water providers started in the 1980s and dramatically escalated in the 1990s when it increased from several companies to more than 2,350 private companies. Although private provision has increased dramatically over the past several decades it still only accounts for only 5 to 10 % of the worlds water provision and even less in relation to sanitation.[84] In America for example although the private water business generates $4.3 Billion per year, private water companies own 16%

[84] The United Nations World Water Development Report, United Nations Educational, Scientific, and Cultural Organisation (UNESCO), 2006

of the water systems and provide 73 (of the 307) Million Americans (23%) with water and 3% get private wastewater facilities.[85]

In England and Wales there has been complete water privatisation for over two decades. The role of the State has transformed from a service provider to a service regulator and what was once seen as a national commodity is now purchased as an individual product.

Recently water and its distribution has become the top topic of national and international debate. A considerable amount of publicity has been focused on the opponents of water privatisation and their arguments. A crusade has emerged against private water companies, strong and emotive language is often used with the advocates such as Barlow (as discussed later in the Thesis) believing that it is immoral for private companies to provide water. Regardless of the stance on water privatisation it is irrefutable that privatisation has been widely debated and is nowhere near consensus as Prasad states:

"*Whereas there seems to be a general consensus among policy makers and experts that governments should disengage from the telecommunications*

[85] National Association of Water Companies (http://www.nawc.org/resources/documents/pwsp-quick-facts.html)

and electricity sectors, government's role in the supply of water services is controversial. Unlike some other fields of public utilities infrastructure, water is seen as unavoidably social in nature and evokes political emotions like no other issue… Private sector participation in water is one of the most controversial topics in the development field today. On one side are those who argue that, since the government has failed to provide access for everyone, it is worth turning to the private sector and market principles to solve this problem. Those who advocate the involvement of the private sector in water supply (the international financial institutions, bilateral donors, professional associations and some academics) argue that this may be expected to improve efficiency, extend the service, bring in more investment and relieve governments of budget deficits.[86]*"*

The privatisation and the subsequent resulting uprising in Bolivia is used as the prime example for opponents of privatisation. These individuals often group all forms of privatisation together without discussing the advantages and disadvantages of the various forms of privatisation. The Bolivian example, (which is not a focus of this study) was an unsuccessful example of privatisation. In Cochabamba a private service provider was granted not only

[86] Prasad, N "*Privatisation Results: Private Sector Participation in Water Services After 15 Years*" Development Policy Review, 6 (669-692) 2006

exclusive service provision rights but, exclusive rights to the water resource, which prevented smaller providers distributing essential resources. This resulted in one of the factors, which led to civil unrest and the eventual reversal from private to public provision.[87] It should be noted however that the example in Cochabamba is more complicated than opponents of privatisation would have the ill informed believe and has been emotively and emotionally dramatised in films such as '*Flow*'[88], '*Thirst*[89]' and '*Given the Rain*'[90]. In this Thesis the main seminal works both for and against privatisation will be highlighted and from these works a system of evaluating effective provision has been devised. The key components in a system of effective provision have been highlighted through the main areas of discussion and concern raised in current literature on the topic, these elements are then used later in the text to determine if there is effective provision in the systems of Great Britain, particularly the private provision in England and Wales.

[87] Nickson A, Vargas, C "*The Limitations of Water Regulation: The Failure of the Cochabama Concession in Bolivia." Bull. Lat. Am. Res. 21 (1):99-120, 2002*
[88] http://www.flowthefilm.com/
[89] http://www.thirstthemovie.org/
[90] http://eventherain.com/

Private Provision England and Wales

"*[Internationally] The record of private sector involvement has been mixed and there are often wide gaps between the effectiveness of regulatory powers and private sector operators…Successful water services privatisation will require a clear set of rules that promotes both equity and efficiency in water distribution, effectively enforced by an independent government regulator adequately equipped with authority, finances and human capacities*." [91]

It is the purpose of this work to ascertain whether the model in England and Wales is a successful provider, with rules, or elements of effective provision, which adequately assess provision and ensure that the providers are monitored by a professional and competent independent regulator as mentioned in the United Nations World Water Report (above).

If the world is to continue its increasingly rapid consumption of water, all forms of provision must be considered as possible options, including provision by the private sector. There is currently growing pressure from political and financial institutions to incorporate corporations into the

[91] The United Nations World Water Development Report, United Nations Educational, Scientific, and Cultural Organisation (UNESCO), 2006

provision of water at a regional, national and international level. The private sector must now be viewed as an opportunity and not as a threat to water distribution.[92]

In studying countries where privatisation has been established at a national level this enables diagnostic assessment of whether privatisation is working at a national level and if so, what could be gained by that national experience at an international level.

Water privatisation does not always follow one set format indeed there are various types of water privatisation. Before there is an analysis into the forms of privatisation in Great Britain it is essential to highlight the various forms of privatisation.

The Definition of Privatisation

There are a variety of ways in which water can be privatised. Each country determines who owns the actual physical compound and when and if that right passes. When most discuss the privatisation of water it is usually the

[92] Kysar, Douglas "*Sustainable Development and Private Global Governance*" Cornell law Faculty Publication, Cornell Law Library, 2005.

case that this is a term used to describe the privatisation of the utility provision, as opposed to the privatisation of the compound. There are different types of private provision, which are in use across the globe.

The World Bank, a great advocate and enabler of water privatisation, has given loans to governments to improve their water systems and also to enable privatisation since the 1960s. In its 'Toolkit' for privatisation the World Bank breaks the different types of privatisation into five models[93]: Management Contracts, Affermages, Leases, Concessions and Divestitures.

Divestiture is the most complete system of privatisation and the English and Welsh system is labelled as such. This is the system, which bestows on the private sector the most power and responsibility. The operator is the proprietor of the utility provision including owning both the operating assets and the infrastructure to support those assets. There is both great freedom in the management and the operation of the provision, but there are also great financial burdens and there may be political restrictions such as to the price that can be set. The government (contractor) may set terms at which both the

[93] The five different models are discussed in: The World Bank, (Public-Private Infrastructure Advisory Facility) "*Approaches to Private Participation*" The International Bank for Reconstruction and Development / The World Bank, 2006. A recommended resource for further reading and explanation of the different types of privatisation.

operational and infrastructural assets would transfer from the operator to the contractor if and when a lease (or license) is either terminated or revoked, thus providing a great incentive for the operator to retain the position as provider in order to receive as much incremental return from the installation of any infrastructure.

In the English and Welsh models the regional districts for operation were unchanged when there was a transfer from public to private. The water companies were appointed as vertically integrated regional monopolies, who provided all of the utility services to their customers from the extraction of the product to the delivery to the end user.

Divestiture is the most complete stage of privatisation, by studying divestiture most of the component parts of the other systems (Management Contracts, Affermages, Leases and Concessions) are also analysed. The legal implications for applying and monitoring this system shall be discussed in full, using the example of England and Wales.

Types of Privatisation[94]

Management Contracts. These tend to be fixed fee fixed time contracts where an operator manages the utility in return for a fee, which is not variable on the tariff charged. Managerial contracts usually enable the corporation to alter the way in which the utility is run and operated. Both the operational and the infrastructural assets, are owned by the contracting authority, which is usually the government. An example where this system was established was in Amman in Jordan.

Affermages. This term is used for a management system, which is similar to that of the Management Contract. In an Affermage a company has the power and responsibility of managing the operations, and generally obtains a revenue through the quantity of water sold. The way in which the revenue from customers is divided does however differ as in a Management Contract the revenue from customers goes to the operator who in turn pays a lease payment to the contractor. In the Affermage the operator and the contractor divide the customer tariff. In a Management Contract the operators are not

[94] The five different models are discussed in: The World Bank, (Public-Private Infrastructure Advisory Facility) "*Approaches to Private Participation*" The International Bank for Reconstruction and Development / The World Bank, 2006

expected to build or contribute towards the cost of infrastructure, however in the Affermage system the operator may be asked to contribute to infrastructure or in the maintenance of that infrastructure, some may use this as an example of Public Private Partnership. The operating assets would usually be owned by the operator in an Affermage, which contrasts with a Management Contract, where the contractor would own both the operational equipment and the infrastructure. Examples of a locations where this system was established includes Cartagena, in Columbia and Senegal.

Leases. A lease is almost identical to an Affermage, however there are significant differences. The most prominent difference is in the way that the operator calculates return. In the Affermage the operator and the contractor divide the customer tariff. In the basic lease the contractor is paid a lease fee by the operator and the operator collects a tariff from the consumer which includes operating and maintenance costs.

Concessions. The Concession divests more power and ownership in the operator than the previous three models. In a Concession the operational assets but not the core infrastructure is owned by the Concession and thus

the pecuniary risk is greater and requires substantial independent investment. Manila in the Philippines introduced the Concessionary system in 1997[95].

Divestitures. This is the system, which bestows on the private sector the most power and responsibility. The operator is the proprietor of the utility provision including owning both the operating assets and the infrastructure to support those assets. There is obviously both great freedom in the management and the operation of the provision but there are also great financial burdens and there may be political restrictions such as to the price that can be set. The government (contractor) may set terms at which both the operational and infrastructural assets would transfer from the operator to the contractor if and when a lease (or license) is either terminated or revoked, thus providing a great incentive for the operator to retain the position as provider in order to receive as much incremental return from the installation of any infrastructure. Divestitures operate in Chile and also in England, the later being the chosen location of study and analysis.

In the study of a complete divestiture it allows the analysis of the other components (or at least most components) of the other private systems, as

[95] For further reading see, Dumol, M "*The Manila Water Concession*" World Bank, 2000

the other systems are different systems, which led up to full privatisation and complete divestiture. In so doing, it is possible to analyse (from one national system) the component parts of the various aforementioned systems and assess their practical application.

Privatisation the Definition in England and Wales

"*Privatisation is the process by which the production of goods or services is removed from the government sector of the economy.*"[96]

The World Bank considers the system in England and Wales to be that covered under the title of 'Divestiture'. At a National level the system is seen to be totally private. The Companies are owned and operated privately. (The system in Wales is what is called a mutual and is a fully described and defined later in the work.) There are however rigorous controls, which determine the profits that each provider can make and the amount, which the providers can charge the consumers for supply. This does not alter the considered legal standing of the providers. Indeed with the banking crisis

[96] Pirie Madsen (President of the Adam Smith Institute), "*The Concise Encyclopedia of Economics*" :
(http://econlib.org/library/Enc1/Privatisation.html)

being in part linked to a lack of regulation in the private system[97], regulation and privatisation once considered opponents are now being seen as fundamental. The financial crisis was caused by individuals, but those individuals were not restricted to the degree now expected by regulatory frameworks, which control balance market liberalisation with financial prudence. Since the crash the call from society and academics has not been to scrap the legislation, but to alter its concentration. "*The current crisis has forced a fundamental reconsideration of financial regulation; and rightly so since much of the focus, and of the effects, of the existing system were badly designed, with its concentration on individual, rather than systemic, risk and its procyclicality*."[98]

Privatisation, like many concepts is different in different places. The extent to which the system is removed from government control by the regulations

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[97] "*Stating that the current crisis is, fundamentally, a crisis of the regulatory framework may appear as a radical overstatement that makes regulatory authorities the only culprit in a complex crisis where the business cycle, monetary policy, current account imbalances, financial innovation, greed and incompetence may be seen as equally essential. Yet, in the end we have to acknowledge that the crisis is a crisis of the regulatory framework*." Freixas X, "*Post Crisis Challenges to Bank regulation*" Economic Policy, Fifteenth Panel meeting: (http://www.cepr.org/meets/wkcn/9/977/papers/freixas.pdf)

[98] For a detailed insight into the Banking Crisis and the legislation surrounding it see; "*The Future of Finance*" London School of Economics Report, 2010. Quotation taken from, Goodhart C "*How Should We Regulate The Financial Sector*" page 165: (http://innovbfa.viabloga.com/files/LSE___the_future_of_finance___aug_2010_1.pdf#page=221)

imposed upon it, and at what point the system becomes provision somewhere between public and private is subjective.

In the English and Welsh models the regional districts for operation were unchanged when there was a transfer from public to private. The water companies were appointed as vertically integrated regional monopolies, who provided all of the utility services to their customers from the extraction of the product to the delivery to the end user.

A private system does not necessarily mean that there should be no or indeed little governmental or regulatory involvement. Indeed if there were to be a completely free market (like many other goods) then there would be a system with many problems of provision including supply.

"*Free market competition would not guarantee universal supply as rational suppliers would not be prepared to sell water to non-profitable customers. Particularly, as the law does not allow us to disconnect domestic customers. Is this compatible with free market competition?*

Most utility industries are subject to some degree of regulation. Water in

England and Wales has separate quality, environmental and economic regulators. Each regulator has a different function. Quality regulation is a technical issue largely about ensuring compliance with prescribed standards to guarantee safe drinking water. The environmental regulator ensures that long term resource plans are produced. The economic regulator in the absence of a market sets prices on behalf of customers. It is hard to understand how the water industry could operate in the customer's interests without all these regulators…

As explained above an industry completely free of regulation is unlikely to be a practical option."[99]

The system in England and Wales is perceived as a private system by both institutions such as the World Bank, the British Government and importantly the private sector[100].

"*Yes [The system is truly private], but we recognise that perhaps more than any other service in an advanced society water and wastewater management*

[99] Interview with Richard Allison, South East Water, See Appendix 1
[100] Annex 1 details multiple interviews from a variety of executives who are in and specialise in the British water industry and not one considered the system not to be completely private.

will (and should) always be on the political 'radar' and subject to robust regulation."[101]

"*The way in which the industry is regulated, and in particular the use of the regulatory asset base, has been crucially important in ensuring that investors have had the confidence to supply these long term, low cost sources of capital. The operation of water services through regional suppliers has ensured that economies of scale and economies of scope can be maximized, whilst regulatory incentives have served to aid efficiency – and therefore value for money – for bill payers. The water industry retains a strong public service ethos and operates to the very highest standards of corporate social responsibility. However, we are unambiguously privately owned companies with responsibility to maximize long term shareholder value. We do this through optimizing use of resources in the long term interests of the stakeholders."*[102]

It may indeed be good for private enterprises to do certain things and the government to refrain. Regulatory supervision of the private sector on what and how they do those things does not diminish their status as private.

[101] Interview with Geoff Loader, Southern Water Limited, See Appendix 1
[102] Interview with James Bullock, United Utilities, See Appendix 1

Part 3

Chapter Components and Objectives

Chapter 2

Current Literature and Methodology

A detailed analysis of several current seminal works has been carried out in Part 1. This work uses the main concerns raised in these works, in order to ascertain the most important factors to determine whether a system of water provision can be called effective. These factors of effective provision will then later be used to study the systems in England, Wales and Scotland.

Part 2 of this chapter details the methodology used in the Thesis called 'Elite Interviewing'. It discusses the way in which information was gathered and analysed. In addition it discusses its validity and reliability of the information collected and how this will be employed.

Chapter Objectives

Detail current literature on the subject of private water provision.

Discuss main issues raised in the literature and also the areas which are lacking in detailed study.

Highlight from the works studied areas which can be used to determine effective provision of a water system.

Describe the Methodology Used in the work.

Explain why it was chosen and the benefits and drawbacks of the method.

Chapter 3

The Transformation to Privatisation

This Chapter describes the background and development of the private water model, which is currently present in England and Wales. The information provides a historical account of the shift from nationalisation to privatisation.

The chapter will also explain why nationalisation was initially popular yet eventually unsuccessful. Nationalisation's failure and the decline of Great Britain brought a new wave of Government, this decline and transition shall be described. The rise of Thatcherism and the move towards privatisation shall also be examined.

Chapter Objectives

Understand the way in which water was provided historically in the British Isles.

Outline the drastic repercussions on Great Britain of WWII.

Narrate the economic shift in theory towards Thatcherism.

Describe the transferring of public provision to private provision.

Chapter 4

Scotland

Scotland is the only country in Great Britain to have retained a system of public provision. This chapter details why public provision was retained. In

addition it describes the system in Scotland including the public provider and its legislation and governance. The chapter incorporates sections of first hand interviews with the Chief Executive of Scottish Water and the Business Development Executive of Business Stream.

Chapter Objectives

Evaluate the reasons behind the retention of public provision in Scotland.
Discuss Scottish Water, its structured legislation, regulation and provision
Explain the private element of Scottish Water (Business Stream)
Assess the provision of Scottish Water and ascertain if its provision is effective.
State possible future threats and proposed changes including the possibility of privatisation.

Chapter 5

Legislation

With Privatisation there has been more rather than less regulation. It has been this regulation, which it can be argued, has pushed privatisation into existence with the compulsion to adhere to European Standards. In addition, at a national level these new regulations have allowed privatisation to form and operate in a structured and controlled environment. The liberalisation of the markets has brought more not less legislation, but it is through this legislation that privatisation has been able to operate. This Chapter explains the original roots of water law and develops to incorporate both the National and International laws governing the current system of provision.

Chapter Objectives

Ascertain to what extent privatisation has increased or decreased legislation.

Discuss the roots of water law.

State water law relating to (non utility provision) rivers, surface water and the sea.

Explain how European laws are integrated into British legislation.

Outline the international and national water laws.

Chapter 6

England and Wales

The legislation is only one half of the monitoring process of the water sector, the other lies with the regulators who have the responsibility to constantly monitor the industry. In Part 1 these regulators will be explained, their roles described and evaluated. In addition to this the effective nature of the provision in England will be evaluated by analysing its key performance criteria and to assess whether performance in these criteria have been impacted positively or negatively through privatisation. This evaluation is to be found in Part 2.

In Part 3 after the system in England is analysed the focus will be on Wales. Welsh Water is another example of unique water provision. Unlike Scottish Water it is completely private, but holds a different structure from the corporate providers in England. This section of the chapter shall describe Welsh Water, its establishment, legal structure and liabilities. It shall also

describe the progress since establishment. The purpose of the analysis of Welsh Water is to ascertain whether its provision is one which is effective.

Chapter Objectives

To determine the main regulators and their roles, including:

The Department for Environment Food and Rural Affairs, The Environment Agency, The Drinking Water Inspectorate and Ofwat

Understand how prices are controlled by Ofwat

Evaluate Effective Provision through six key performance criteria:

Access

Quality

Price

Economic

Environment

Sustainability (The focus and analysis will be in Chapter 7)

Describe the corporate structure of Welsh Water and its status as a mutual.

Provide an analysis of Welsh Water as to ascertain whether its provision is one which is effective. Its effective provision shall be ascertained under the six key elements (performance criteria) of effective provision. Integrated into the explanation of Welsh Water and the statistics demonstrating various elements of its provision, is the interview with Nigel Annett. Nigel Annett was the founder and has been Welsh Water's Managing Director since its inception.

Chapter 7

Sustainable Development and Catchment Management

This chapter discusses the important issues relating to Sustainable Development and Catchment Management. It discusses where there have been failures in Sustainable Development and the recent improvements that have been made. Ofwat's role in relation to Sustainable Development and Catchment Management is then discussed in Part 2, including what Ofwat's legal duties are, what it is currently doing and what should be done in the future.

Chapter Objectives

Analyse the position on Sustainable Development

To Ascertain the possible development gap and why it arose.

Understand what various stakeholders think should be done to improve Sustainable Development and Catchment Management.

Analyse DEFRA's White Paper and progress since publication.

Highlight Ofwat's responsibility with Sustainable Development and Catchment Management.

Critique the Report on Ofwat.

Evaluate what Ofwat should do to improve.

Chapter 8

The Future of Water / The Conclusion

Part 1 of this chapter discusses several water related problems affecting Great Britain, which are related to climatic changes including the impact of flooding and drought.

Part 2 of this chapter deals with future global concerns relating to water. From this the possible future changes relating to water will also be discussed.

Part 3 of this chapter provides a summary and conclusion of the findings of the Thesis. The Thesis ends with several ways in which global water provision could learn from the development of the system in England and Wales.

Chapter Objectives

Highlight current British problems with water and the environment

State future global concerns including;

Sustainability, water theft and water terrorism

List possible changes in the water industry

Highlights the benefits of private provision in England and Wales

Outline what can be learned from the system in England and Wales

Provide Concluding Remarks

Conclusion

The importance of water for humanity is undeniable. Water is irreplaceable, necessary and reducing in availability. There may come a time where technology reaches such a level that each individual does not have to be concerned about the infrastructural management and provision of water services, but that time has not yet arrived. The provision on water and its study is of great importance and one way in which it can be provided is through various forms of private provision.

Before there can be a detailed analysis of the provision and a determination of if that provision can be deemed as effective, then it is essential that there is a determination as to the most important areas of provision. In determining these key performance criteria, seminal works of literature have been studied and analyzed to gather what current academics determine to be the areas, which are most important to provision. In addition to this a full and detailed description and evaluation of the methodology used is contained in the following chapter.

Chapter 2

Current Literature

Introduction

A comprehensive analysis of effective provision has not been carried out on the systems of England, Wales and Scotland and although there was a small flurry of activity immediately post privatisation (which concentrated on England), there are no recent academic works of analysis. There are however several works which raise issues from an international perspective on the privatisation of water, it should be noted that the majority of the works do not advocate privatisation. The purpose of including these works is to incorporate a global dimension to the water provision question and to understand that global concerns and issues of importance can be used to study water provision in a national context. A detailed analysis of each country would be necessary for a conclusive determination as to whether the statements of the below seminal works are accurate, this is not in the remit

of this work. This work uses the main concerns raised in order to ascertain the most important factors in determining whether a system of water provision can be called effective. These factors will then later be used to study the systems in England, Wales and Scotland.

The factors which are most important to the effective provision of water are :

Access – Access to the water for all who need it.
Quality – A high quality must be provided for all water consumed.
Price – The price must be affordable for all.
Economic – If private provision, it must be economically sustainable and provide investment to infrastructure and maintenance.
Environment – The Environment must be protected
Sustainability – Provision must be Environmentally Sustainable

Blue Covenant[103]

Blue Covenant was a prescribed text in Cornell's Water Law course and is one of the most popular books on water. It is featured in the documentary

[103] Barlow, Maude "*Blue Covenant*" The New Press, 2007Fli

Flow and its author Maude Barlow is renowned for her views on water and water privatisation. Her attitude towards privatisation can be summarised in the below quotation:

"*Water privatisation has been a complete failure. Almost twenty years of documented cases of the failure of privatisation and growing opposition to the World Bank and the water service companies in every corner of the globe have revealed a legacy of corruption, sky high water rates, cut-offs of water to millions, reduced water quality, nepotism, pollution, worker layoffs and broken promises. The reality is that for profit companies even if operating honestly, cannot practice desperately needed water conservation and source protection*."

Blue Covenant from start to end categorically condemns any form of privatisation, there is even a chapter titled, "*Water Privatization Has Been a Complete Failure*." Barlow states that privatisation leads to many problems including, increased pollution, increased price and a deterioration of water quality. Barlow has five cardinal concerns, which have been recorded below:

Access

Barlow states that the private system is flawed because the water will flow not where there is need but where there is money. She states that corporations will not deliver to the poor and that '*people who cannot pay do not get served*.' If this is true then the provision of water would clearly not be classed as effective for those who could not pay. If water was not provided there would be the additional impact of lack of sanitation and therefore disease, which would in turn have implications on not just the poor, but the community at large. In order that there is a provision, which can be classed as effective, it must be effective not only for the rich but the community as a whole, including the poorest in society. This water must include water and sewage needs. Barlow states that these needs are not met where water is provided to the public through privatisation.

Quality

Barlow states that one of the side effects of privatising water is that there is a reduction in water quality. She states this in general terms and then goes on to provide examples one of which is the Philippines, where she states that

after privatisation water services deteriorated rapidly in particular for the poorest of Manila, who suffered a cholera outbreak due to unclean water which contained contaminants including Ecoli. For Barlow privatisation is synonymous with a decrease in quality as the only true motive of a corporation is profit. One such way to increase profit is to increase price.

Price

In a variety of countries, post privatisation have increased the cost of water to such an extent that it is unobtainable for many. Barlow uses the example of Indonesia, which privatised its water in 1998 and states that post privatisation water connections for the poor dramatically decreased after privatisation and rates increased by 35%. In relation to Great Britain, Barlow states that the privatisation in England held 'obvious failures' which included the fact that providers were given '*free reign to charge what they liked*'.

Pollution

Not only are private water providers not motivated to reduce pollution in the waterways but, it is in their advantage to have more pollution. "*There is no profit in conservation. In fact it is to the distinct advantage of the private water industry that the world's freshwater supplies are being polluted and destroyed.*" Barlow's philosophy is that the reduced availability of water is driving the price of water up to the benefit of the private providers.

Economic

The economic viability of water providers is also questioned by Barlow, stating that it is impossible for corporate providers to meet the needs of both the customer and the shareholders. She states that in areas where there is great poverty the only way that there can be provision through public providers is if those providers depend on public subsidies.

The Water Business[104]

Sjollander Holland describes one of the most infamous examples of privatisation was that of Cochabamba in Bolivia. In Cochabamba in 2000 a

[104] Sjolander Holland, "*The Water Business*" , Zen Books Limited, 2005

water contract was signed between the Bolivian government/regulatory body[105] and Aguas del Tunari, which was a private foreign water consortium. This contract empowered Aguas del Tunari to exclusively supply water to customers in the region for a forty year period. The Water Service Law of 1999 provided exclusive rights to Aguas del Tunari to the exclusion and restriction of all others, including the drilling of wells on private property. This in effect made it illegal for small farmers to drill for water in the traditional method on their own land and it also prevented them from irrigating their fields.

The regulator's duty was to control the price at which this water was provided, but as Sjollander Holland states the regulator failed in its task to maintain an adequate restriction on prices. The result was that the average water bill rose by 43% (for the poorest) within a short period of time after private provision. Water connections also rose by over 30%, to put this in perspective an average worker would earn $220 per month and was expected to pay $130 for a water connection. These high prices resulted in many being unable to afford water provision, which caused a high amount of civil unrest and social discord.

[105] Technically the contract was not signed by the Government but *La Superintendencia,* which was the regulatory body in charge of water provision.

What resulted were mass protests in Cochabamba, which were latterly known as the Water Wars of Cochabamba. The protests were a culmination of various members in society including; Union activists, teachers, workers, environmental groups, students, farmers and those residents who were impacted by the water rises. The protestors formed a fellowship against privatisation called la Coordinadora de defensa del Agua y la Vida. Thousands gathered in protest and to demonstrate against the new form of water provision. Highways were blocked, marches were carried out all over the city and this culminated in a protest of over 100,000 people in addition to a general strike, which saw public services such as schools close. Finally the government under considerable pressure cancelled the private provision and returned the provision to the public water utility.

Sjollander Holland also gives details of the problems faced by those in Buenos Aires. Many in Buenos Aires live in informal settlements or squats. When privatisation was initiated by Aguas Argentina it was heavily criticised for not providing water to the poor particularly in illegal settlements. There have however been recent connections to unregistered settlements through pressure from residents, NGO's and community

petitions. There still remains a problem with connections to illegal slums (favelas) but water connections have risen to over 88%.[106]

Water Under Threat[107]

Bouguerra is another author who systematically criticises privatisation and states examples of private provision failures in a number of countries. In Britain he states that privatisation led to increased prices and many water disconnects. In Manila, he states that water privatisation has been a 'complete failure' with prices increasing between 500 and 700%.

Bourgerra also uses the example of South Africa where he states that water privatisation was the cause of the worst cholera epidemic in its history. He explains that the International Monetary Fund imposes privatisation as a prerequisite of various forms of financial relief. Years after the apartheid in 1996 the new government adopted cost saving techniques which were advised by the World Bank and the International Money Fund which meant that certain public services should be self financing, thus leading to the

[106] Government Census (2010) : http://saladeimprensa.ibge.gov.br/en/noticias?view=noticia&id=1&busca=1&idnoticia=2057

[107] Bouguerra Larbi, "*Water Under Threat*" Zed Books, 2006

private provision of water. Large international providers such Vivendi and Suez became the new water providers and had the responsibility of distribution, but this was at a premium. The cost of provision rose dramatically and many opted to collect water from non-mains provision, thus evading bills. These alternate sources of water were not purified and held disease such as cholera. Many of the poorest in society who extracted and imbibed the water fell ill with cholera and other water carried disease and around 260 people died.

Bourgerra believes that above all water is an '*inherited common good before it is an economic good*'. He highlights that the production cost and the '*use value*' bear no relationship to one another and that the provision or use of water should not be reduced to its cost of production. He argues that the laws of the market should not apply to the supply of water and that the social importance of water should be given priority. He states that water companies are mere merchants setting 'traps and manoeuvres' to obtain as much profit as possible with no regard to the need of the people or their exploitation. He states that the market of privatisation makes the water problem worse and highlights what he believes are these prime reasons (which have been abbreviated); The primacy of profitability, the role of competition, the global

race to build financial and industrial giants,which tends to poison economic and geopolitical struggles between countries for the control of natural resources, contempt for the principle of community interest, contempt for the principle of fair and reasonable use.

The Business of Water and Sustainable Development [108]

Chenoweth and Bird in their work compiled a variety of comprehensive articles by a selection of academics which details a variety of water related issues many concerning provision through privatisation:

Morris[109] (The involvement of the Private Sector in Water Servicing – Effects on the Urban poor in the case of Aguascalientes, Mexico)

In the article by Morris she examines the relationship between private sector participation and provision in the water sector has an impact on the urban

[108] Chenoweth and Bird, "*The Business of Water and Sustainable Development"* Greenleaf Publishing, 2005

[109] Morris L and Cabrera L, "*The involvement of the Private Sector in Water Servicing – Effects on the Urban poor in the case of Aguascalientes, Mexico*" In, Chenoweth and Bird, "*The Business of Water and Sustainable Development"* Greenleaf Publishing, 2005

poor in Aguascalientes, Mexico. In 1993 Aguascalientes signed a 25 year contract with a consortium of private providers to carry out the delivery and maintenance of the water system. The transfer resulted in a sharp rise to water prices (around 60%) and many water disconnects due to the non payment of bills. In addition to the higher prices Morris states that the water quality actually deteriorated and the water use was not seen to be sustainable. Morris argues that regardless of cost there should be water provided to all as a basic human right. She argues that water should be provided to all domestic customers as a priority before any non-domestic non essential usage is considered. In addition she comments that there needs to be a better relationship between the providers and the consumers, which they serve. This may be done in the form of public participation in the decision making process where both the providers and the customers could communicate in a fashion where it is possible for them to share goals.

Lloyd Owen[110] (The Private sector and Service Extension)

In this article Lloyd Owen describes the development of privatisation, moving from countries which are developed, to developing or third world countries. He initially describes how many countries in the west and in particular in Europe have offset the burden of extending and upgrading municipal water provision from local and central government to the private sector through privatisation. This is now being done not only in the west, but in many poorer countries around the world and this transition is being supported both by the International Monetary Fund and the World Bank.

He states that many who criticise the price of private provision ignore the issue that the water under many public provisions is unsafe and the price which is paid (to private providers) is one which secures quality and availability. He uses the example of provision in Manila to illustrate that private provision can improve the service not only for the rich but also for the poor. " *What can the private sector offer to the unserved urban poor? For multilateral institutions, governments, municipalities and the private sector, PSP (private sector participation) in service extension can be an*

[110] Lloyd Owen , David "The Private sector and Service Extension" In, Chenoweth and Bird, "*The Business of Water and Sustainable Development"* Greanleaf Publishing, 2005

effective tool where projects are delivered more cheaply, new sources of finance are mobilised and existing assets are operated more efficiently. These benefits apply to all water and sewage PSP projects but are particularly pertinent here. United Utilities' water and sewerage contract in Manila (Philippines) reduced prices by 65% in 1997 and is performing satisfactorily in terms of finances and delivery. The 24 hour water delivery increased from 22% of the network in 1997 to 80% by 2001, with 99.7% water quality compliance; 50,000 low-income households were connected by 2004 with a further 19,285 households (115,700 people) in the first six months."[111]

Lloyd Owen is overall an advocate of privatisation stating that the models used in Great Britain, France and North America can be used for the development and implementation of private provision in other developing countries. He states that for developing countries such provision has shown to be. "*an increasingly robust and attractive proposition"*. This option of privatisation he recognises is only one part of the solution and that private provision has challenges which it must overcome. Such problems include communicating to the customer the benefits and pitfalls of private provision.

[111] One should note that Barlow has a different opinion of privatisation in Manila and links it to the spread of water carried disease.

He also states that the private sector must focus and address on various social and environmental issues (which he does not stipulate). Lloyd Owen although positive towards privatisation does not advocate it as a true and infallible panacea to eradicate the world's water provision needs, he does however highlight that the different services and forms of private provision are part of the solution.

Renzetti and Dupont (Ownership and Performance of Water Utilities)

Renzetti and Dupont[112] have tried to ascertain if private or public ownership of water provision has a better record of performance. They do this by analyzing twenty articles (all concerned with performance in the water industry) concerning the private and public systems in the UK the US and France. Their main conclusion is that there is no conclusive empirical evidence either within the system in the UK or taking the other two countries and combining the experiences as a whole. Renzetti makes it clear that more research is needed into the area of private and public provision and that there is a clear void of empirical analysis.

[112] Renzetti S and Dupont D, "*Ownership and Performance of Water Utilities*" In, Chenoweth and Bird, "*The Business of Water and Sustainable Development"* Greenleaf Publishing, 2005

Without analysing the statistics quoted in the text it should be noted that this article written in 2005 studies other related data, which was written between 1977 and 2001. The articles which cover the UK experience range from 1993 to 2001. Thus although the article quotes various articles stating that ' *More stringent environmental regulations have led to improved drinking water and river quality'* it should be noted that this article like almost all of the works studying privatisation are seriously out of date. The most comprehensive review by the most prolific academic in the field of British study (Karen Bakker) was written over ten years ago[113]. Any statistical analysis is more valuable if it considers more data. It is the desire of this study to consider the most recent data and to fulfil the most comprehensive analysis of statistics covering a variety of areas.

[113] Bakker Karen, "*An Uncooperative Commodity: Privatizing Water in England and Wales*" Oxford University Press 2003.

Poisoned Spring

In the work Poisoned Spring[114], Liotard and McGiffen have a negative take on privatisation stating that as an asset it is '*too important to be left to private corporations*'. Their argument is given in both terms of the practical and importantly the moral philosophy and ideology that privatisation is inherently bad. '*Experience, as opposed to ideological prejudice, has demonstrated that private sector ownership of water and sanitation services, is unnecessary and undesirable. Water is a public good, and can be perfectly well managed under public ownership and control. That it is not always so managed is no argument for privatisation, but rather one for addressing inefficiencies while maintaining public ownership. ..*"

One of the main arguments against environmental impact is that with privatisation comes environmental degradation, which harms not only the environment, but the water supply and the inhabitants. The authors state that the ideological movement of privatisation is backed by institutions such as the World Bank and incorporate the ideals of large corporations who only have profit to consider. "*Privatisation has had hugely detrimental effects on*

[114] Liotard, K and McGiffen S, "*Poisoned Spring, the EU & Water Privatisation*" Pluto Press, 2009

the environment...". From every point of view bar that of the shareholders and corporate executives who have grown rich on it, privatisation in Britain has been an unmitigated disaster"

The authors state that privatisation has put water provision as only a secondary goal behind making profit and say that it has been a global experiment which has turned sour on a massive scale and that if water is to be legitimised as a Human Right[115] such provision can only be done through the public sector as its treatment as a commodity is unacceptable. The work states a variety of countries within and out-with Europe. In France it states that privatisation was peppered with corruption and poor organisational supervision and provision. In general they criticise private provision for being costly, unable to raise cheap finance and the dependence on public subsidy. They state, *" Profits come from public subsidies, whether open or disguised. First you gain control of the most vital of substances, then you use this control to bully public authorities into handing over what are effectively your only profits*."

[115] The literature quotes the 1992 Earth Summit in Rio di Janeiro.

Specifically the work criticises the privatisation in England and Wales. The work states that privatisation brought large financial gains for the shareholders and managers, but a reduction in the workforce. In addition the provision was halted in many cases by the disconnections of those who did not pay their rates. The authors also criticise the low level of investment by the private companies on infrastructure and provision, a lack of efficiency and price increases.

"*The 1980s was the decade during which the British people were cajoled, tricked and bullied into allowing their property to be taken off them and sold for next to nothing to people of extraordinary wealth, many of whom had made substantial slices of that wealth available to Thatcher's Conservative party. The snouts were deep in the trough filled with wealth created by British working men and women. People were told that they now had, through the sale of shares in newly privatised companies, the chance to become owners of their own services. The fact that they were already owners of these services was obscured by the Americanisation of an aspect of British thought. People had been persuaded that the State was an entity entirely separate to them, not even potentially under their control and hostile to their interests*."

Water for Sale

"Claude Genereux, vice president of the Canadian Union of Public Employees, has put the argument simply: '*Water is a basic human right, not a commodity to be bought, sold and traded'. … Simplistic arguments like this do not present any alternative solution and are founded on ideological conviction, not facts. Many of the active protagonists in this debate are the selfsame nongovernmental organisations (NGOs) and individuals within the anti-globalization movement who used to campaign for restrictions on international trade…Public sector employee unions and other organisations with a powerful vested interest in water remaining under public auspices constitute another group. A third group is the media, which have given the issue generous but slanted coverage. These three groups are found above all in affluent countries. Activist organisations in developing countries make up a fourth group, albeit more limited…Given the capital failure of the public sector to supply poor people with clean water, the positions and actions of anti privatisation activists are hard to understand. In light of the overwhelming evidence, one cannot help drawing the conclusion that they*

are driven by an ideological inspired aversion to enterprise, coupled with fear on the part of vested interests of losing their privileges. These groups share a belief in the superior ability of the public sector to deliver what citizens want, along with a profound suspicion of the market economy and business enterprise in general and Western big business in particular.'[116]

One of the few academic works, which has advocated water privatisation is '*Water for Sale*'[117]. In this work Segerfeldt states that not all water distribution has to be private, but that the private market has positively impacted provision in many places. He states that ideological barriers, which some have against water privatisation is preventing solutions which could incorporate privatisation or the private sector.

Of the many arguments he uses to back privatisation is the fact that it increases the mains connections in countries in particular in poorer countries where the public purse did not stretch to connect poorer districts. In many poor countries many purchase their water either from wells or from small private water sellers. They are thus subject to the movements in price of the micro market of water sales. Segerfeldt then goes on to state that although

[116] Segerfeldt Fredrik, "*Water For Sale*" CI, June 2006
[117] Seferfeldt F, "*Water for Sale*" Cato, 2005

the connections through private provision may increase the overall unit cost, it is still cheaper than that provided by other vendors sometimes by ten times.

He also notes that privatisation is also known for heavy investments in the often crumbling public infrastructure. Such investments are very costly and in order to make the investments possible it is necessary to raise money and this is either done through aid from the state or a rise in price. In order that the poorest are not effectively cut from the supply of water there are a variety of ways in which they can be supplied water through either private or state subsidies or water vouchers. It is also highlighted that although there may be water charges, which are more expensive in the initial privatisation this does not determine that these prices will be more expensive over a longer period of time as most of the initial infrastructural investment will happen at the initiation of privatisation.

The example of Guinea is used to describe where privatisation can be implemented successfully in a developing country. In 1989 when the water management was switched from public to private only two in ten (urban dwelling) residents had access to water which was both clean and safe.

Twelve years from this, since privatisation the number shot to seven in ten, which had a welfare benefit, which was estimated at $23 million. It was the private sector, which tried and succeeded where the public sector had failed in this financially poor country. The need was great as the population was increasing rapidly and the public provider was not able to provide safe water and there was periodic cholera epidemics, which killed many, indeed water borne disease was the main cause of death among infants and children.

In addition to Guinea, Gabon is used as an example of where private provision from a French company invested vast amounts in infrastructure, improved water quality and lowered prices to customers. The private provider increased network coverage thus increasing revenue and providing the corporation with the opportunity to raise more money and lower the average cost. Casablanca in Morocco is also another example given by Segerfeldt. In Casablanca the demand for water grew dramatically with the sharp rise in population, from 1982 the urban population was 8.7 million which leapt to 13.4 million in 1994, this placed massive strain on both the water supply and demand ration and the already decaying infrastructure. In 1997 Casablanca signed a Private Public Partnership. The private firm invested $250 million between 1997 and 2002. The massive influx of

investment greatly improved the effective provision of the service. "*This private concern invested the equivalent of about $250 million between 1997 and 2002, inclusive. This, coupled with the firm's modern technology and management capacity, led to a whole string of improvements. Greater efficiency and reduced spillage enabled the company to supply growing numbers of customers with more water, even though it was producing less. The quality of the water improved. In addition, the company improved the management of effluent, even though that was not included in the contract…In a word the private firm has contributed water distribution competence, experience of running a water company, capital, and technical competence*."

Unquenchable, America's Water Crisis and what to do about it.[118]

Glennon states that privatisation is an 'elastic concept' which is marred in intense debate, but that profit if deserved, should not as a concept or reality be criticised. "*One oft-heard criticism accuses the multinationals of reaping profits from the sale of water. If a company invests tens of millions of dollars in rebuilding a decayed infrastructure, restoring and expanding water*

[118] Glennon, Robert "Unquenchable, America's Water Crisis and what to do about it." Island Press, 2009.

delivery to poor urban and suburban communities, and putting in a place a competent water administration system, it quite justifiably expects the return of its capital and a reasonable profit. Unless the profits are excessive, the fact that the company may earn a profit is not sufficient reason to condemn the corporation as exploitative or privatisation as a bad idea."

He states that the success of the provision is dependent upon a series of integrated components. Glennon notes that privatisation takes many forms and it ranges from merely the delivery to the actual ownership of the compound and its extraction and provision rights. Glennon highlights, the Cochabamba privatisation as an example, which can be used to condemn privatisation and that case has elements, which if it were to be analysed fully would have many questions which would need to be researched and determined:

"*To some what happened in Cochabamba epitomises what is wrong with privatisation. But since the uprising, the cooperatively run water system that replaced Bechtel is in shambles, possessing neither the capital to overhaul the infrastructure nor the experience to run a public utility. To analyze the situation in Cochabamba or elsewhere, one must know the state of affairs*

before the private company arrived. What was the condition of the infrastructure? Was it decayed and neglected? Was everyone in the community receiving water? And what exactly did the company do? Did it built, repair or replace the infrastructure; deliver water to people; charge people for water delivered; respond to the demands of local politicians to divert resources to their pet projects? Except to those who believe that privatisation is ideologically unacceptable, only a before and after comparison allows an accurate appraisal of how well privatisation works."

There are risks in privatisation which are raised by Glennon which include isolating the public in both terms of the decision making process and in actually obtaining the water through price increases. In addition there may be environmental degradation as Glennon states that a corporation has little incentive to protect the environment when supplying water. He states that the corporations do not 'internalise environmental costs' but passes these to the society to deal with, usually decades after the problem was initiated. Glennon does not however condemn privatisation, but states that its effective provision '*or success*' is dependent on a variety of factors. He highlights that unless one is ideologically opposed to privatisation then only a before and after analysis in countries where privatisation has occurred is the only

true measure of its effectiveness. As highlighted previously, it is not the purpose of this work to determine the viability of privatisation and its effective provision in regions out-with Great Britain such as in Cochabamba, but to use the areas of concern as indicators when studying the systems in Great Britain. These crucial factors are the elements, which will determine the effectiveness of provision.

Factors of Effective Provision

There are six principle concerns, which are essential to monitor effective provision of a water system.

Access – Access to the water for all who need it.

Quality – A high quality must be provided for all water consumed.

Price – The price must be affordable for all.

Economic – If private provision, it must be economically sustainable and provide investment to infrastructure and maintenance.

Environment – The Environment must be protected

Sustainability – Provision must be Environmentally Sustainable

Access

The most important concern is access. Without adequate access to those who desire it the water system would be a complete failure. In the above literature all of the problems cited start with the availability of water. What is deemed adequate access in one country may be a communal well within walking distance from a village or home. For the purpose of this study adequate access will be the connection to a water supply within every domestic unit.

Quality

After access the most important issue which one must be concerned about is quality. As has been stated, deadly disease such as Cholera is spread through unclean water. Currently around 5,000 children die every day due to the disease caught from imbibing dirty water[119]. Once access has been established it is imperative that the quality of the water is of a clean and safe standard.

[119] http://www.unicef.org/media/media_19974.html

It is unquestionable that the first two performance criteria are the most important to effective provision, it is more difficult to determine which of the remaining four are more important than the other, but this work does not desire to rank these in order but evaluate them each as important performance criteria.

Price

Price is critical if there is to be a charge. The price has to be at a level which is affordable (relative to income). Thus there may be a situation where there is clean and available water at an unrealistic price and therefore a provision which is available but deficient due to the restriction in price. Price must be considered affordable in relation to several factors; the affordability of the product in relation to the district it provides for, the realistic correlation between the expense of investment and maintenance balanced with a moderate cost and the price relative to other countries of a similar stage in development

Economic

The economic reality of supply should also be considered as the system of provision involves high capital expenditure. A majority of the costs are in infrastructure and maintenance, but there are also costs in the purification process, employees and various other costs. If there is to be effective provision run privately then it must make a profit for it to be sustainable and invest the required amounts to maintain and provide adequate infrastructure.

Environment

The environment must also be considered. The quality of beaches, waterways, rivers, lochs and wetlands must all be evaluated. Many authors have criticised that with privatisation comes environmental degradation and that not only do the private providers do nothing to protect the environment, but a polluted waterway may be favourable as it reduces the supply and increases the demand and price of their product. This work will look not at the political or economic motives of the water industry and their relationship to supply and demand, but shall answer the question as to whether pollution and water quality has increased or decreased since privatisation and if water

quality has increased or decreased. Supplementary to this, these results will be set against European standards.

Sustainability

In addition to the environmental standing of the aforementioned, the sustainability of the ecosystem must also be considered for a holistic appraisal of the effective nature of the system of water provision.

Conclusion

It is a right for academics to oppose water privatisation based on ideology alone. This right may be held even though the public provision is not the most effective form of provision. Holding such a strong position against privatisation is blocking the possibility of new answers through the private sector, but because water is such a fundamental compound to life it brings with it emotive feelings. If the solution to the problem is to be studied intelligently and with an open heart and mind to all solutions then it is irrational to blacken anything related to provision utilising the private sector, be that partially or wholly. Barlow's perception of water privatisation as a

'*complete failure*' is wide. Barlow considers all forms of privatisation to be under one system and that system of provision to have failed. Water privatisation takes many forms and now operates in may countries, two of those countries being England and Wales[120] This work will provide such a comparison looking at the improvements or deterioration of the key indicators of effective provision.

Having objectively studied many of the articles both for and against privatisation, the elements of effective provision encompass what most academics determine to be the most important areas of provision. Such an analysis will determine if England Scotland and Wales have effective provision and will answer questions such as : Is there universal access to water or are those who do not pay prohibited from access? Is the water quality good and has it improved since privatisation? Can, as Barlow suggests, the private providers in England and Wales '*charge what they like'* for water? Since privatisation has there been an increase in infrastructural investment and an improvement in maintenance? Has the environment

[120] In the work both England and Wales are referred to, however the majority of the research has been focused on England. Wales has an independent provider and is in itself a country in its own right, which is incorporated in the Kingdom of Great Britain. Scotland is the only part of Great Britain with public provision and is discussed later in the Thesis .

including beaches, rivers and waterways been impacted in a positive or negative way since privatisation?

Part 2

Methodology

Introduction

The Methodology used in this thesis is called Elite Interviewing. This allows the collection of empirical information from experts in the field of water. This empirical information is not taken in isolation, but is combined and verified with facts gathered from various sources. This chapter includes a review of the research method and states the appropriateness of the design. It discusses the way in which information was gathered and analysed. In addition it discusses its validity and reliability of the information collected and how this will be employed.

The information gathered including that from interviews, followed a consistent focus towards the final Thesis. A structure adapted from Kvale's seven stages of interview enquiry was adopted[121].

[121] Kvale describes the benefits of Investigating with consideration given to the final product. The seven stage process has provided a guide which was adapted and adopted for the Thesis . Kvale and Brinkman, "*Interviews, Learning the Craft of Qualitative Research Interviewing*."Sage, 2009

(1) Theme – {Construct a clear theme in mind.}

The Theme or prime objective in this work was to determine if the provision of water in England Wales and Scotland is effective.

(2) Design – {Operate a form of recoding which enables the information gathered to be utilised in the Thesis . Gather the information with the concept that the interviews (when possible) will be published.}

The Interviews in this Thesis were recorded either by tape or typed during the interview. All the factual information collected was recorded to be (if relevant) included in the final work.

(3) Interviewing – {Record the interviews in a form which communicates in the best way aiding the argument.}

The interview structure is termed as semi-structured and is described in detail below.

(4) Transcribing – {Transcribing should allow the reader to access the relevant information possible and the writer to gain as much as possible from the interview.}

This thesis transcribes full copies of the interviews in Appendix 1 and in addition, particularly relevant sections are included in the body of the text.

(5) Analysis – {The presentation of the results should not be done in isolation but there should be an analysis of the results.}

The relevant numerical information (for example the increase and decrease of bills, employment figures, and taxation statistics) in addition to the comments made during interviews are fully analysed.

(6)Verification – {If information is given in order to validate the information it must be verified.}

Both the facts gathered from primary and secondary sources are verified in addition to facts or factual statements (as opposed to subjective opinions) made during the interviews.

(7) Reporting – {Working towards the final Thesis from the beginning of the interview process will aid the methodology, fluidity and produce findings of interest.}

With this principle in mind this Thesis has been constructed to incorporate factual information from a variety of sources, which relate to the provision

of drinking water and has been supplemented with empirical evidence in the form of elite interviews to add an element of depth and real life practice to those statistics.

Empirical, Quantitative and Qualitative)

"The word "empirical" denotes evidence about the world based on observation or experience. That evidence can be numerical (quantitative) or non numerical (qualitative); neither is any more "empirical" than the other. What makes research empirical is that it is based on observations of the world—in other words, data, which is just a term for facts about the world. These facts may be historical or contemporary, or based on legislation or case law, the results of interviews or surveys, or the outcomes of secondary archival research or primary data collection. Data can be precise or vague, relatively certain or very uncertain, directly observed or indirect proxies, and they can be anthropological, interpretive, sociological, economic, legal, political, biological, physical, or natural. As long as the facts have

something to do with the world, they are data, and as long as research involves data that is observed or desired, it is empirical."[122]

The above definition divides qualitative and quantitative simply by information, which involves numbers and that which does not. Other Academics have deemed these terms to mean considerably more. Quantitative is often used as a term, which defines application of scientific procedures to gather and assess information.[123] Qualitative research is however describes as a process which allows the researcher to gather and interpret information through a series of interactive representations, which include interviews, conversations and fieldwork. Thus allowing for observational learning from individuals in their natural environment.[124] "*The distinction between quantitative and qualitative methods has been the subject of extensive discussion in academic circles. Some scholars say that it isn't so much a question of the researcher deciding which route to go down, but what kind of knowledge he or she is seeking to make, uncover or*

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[122]Epstein L and King G, " The Rules of Inference" The University of Chicago Law Review, Volume 69, 2002
http://gking.harvard.edu/files/gking/files/rules.pdf
[123] Davies MB, "*Doing a Successful Research Project Using Qualitative or Quantitative Methods* " Palgrave, 2007
[124] Miles and Huberman, " Qualitative Data Analysis an Expanded Sourcebook" Sage, 1994 and see also, Davies MB, "*Doing a Successful Research Project Using Qualitative or Quantitative Methods*" Palgrave, 2007

construct.[125]" Coutin[126] states that Qualitative research determines to answer a question rather than to test a hypothesis . As opposed to a numerical or scientific test that quantitative data may rely upon qualitative research, among other things, focuses on those who are engaged in or affected by the area of study. Without wishing to engage in the technical differences between determining the exact terms of quantitative and qualitative it will be taken for the purpose of this work, that qualitative is a non numerically based analysis of facts founded on human interaction and information taken from interviews with elite participants in the water industry.

Research Design Method Elite Interviewing

Definition

Elite Interviewing is a method of directly accessing and communicating with individuals in order to extract and utilise specific information through the

[125] Mc Conville M and Hong Chui, W "*Research Methods for Law*". Edinburgh University Press 2007
[126] Bibler-Coutin S " Qualitative Research in Law and Social Sciences" Workshop on Interdisciplinary Standards for Systematic Qualitative Research (p – 60) http://www.nsf.gov/sbe/ses/soc/ISSQR_workshop_rpt.pdf

interview process. Thus, as described above it would be classed as an empirical and qualitative form of methodology.

Elite Interviewing gives the opportunity to develop a holistic picture of multiple realities and therefore to develop a complex understanding of the research topic.[127] It is essential for a balanced form of inquiry that the industry be interviewed as a whole and include multiple sources and viewpoints. This Thesis has interviewed around 30 Organisations ranging from governmental and charitable organisations to corporate providers. In addition the level of individuals interviewed has been of an 'elite' standard and include Managing Directors, Founders and Senior Professors.[128] No method of study is without both positive and negative attributes, some of which have been detailed below.

Advantages and Disadvantages

Advantages

"*One of the strongest advantages of elite interviews is that they enable researchers to interview first-hand participants of the process under*

[127] White, WF, "*Learning from the Field"*, Sage, 1984. See also Kezar, Adrianna, "*Transformational Elite Interviews: Principles and Problems*" (Qualitative Inquiry) Sage, 9, 395.
[128] A full list of all those interviewed and the interviews can be seen in Appendix 1.

investigation, allowing for researchers to obtain accounts from direct witnesses to the events in question. While documents and other sources may provide detailed accounts, there is often no substitute for talking directly with those involved and gaining insights from key participants. The nature of interviewing also allows interviewers to probe their subjects, and thus move beyond written accounts that may often represent an official version of events, and gather information about the underlying context and build up to the actions that took place.[129]*"*

Information

This study has gained considerable amounts of unpublished data from the use of elite interviewing. Such data is readily available to those in the industry, but is often unpublished. In addition the data is sometimes collected but, no further research has been carried out. An example would be the information provided by The Water Services Regulation Authority (Ofwat), which related to the tax revenue collected from providers and the employment statistics of industry. Ofwat had recorded these figures but had not studied the change in tax collected or movement in employment over a period of time, indeed it is not their duty to do so. Such information is not

[129] Tansey, Olin " Process Tracing and Elite Interviewing: A Case for Non-probability Sampling." Political Science and Politics, Volume 40, No. 4, October 2007

available to the public and would only have been possible through the use of this research design method.

Opinion

Perspective is essential because it brings objectivity to writing through the opinions and insight of others, which the writer may not possess. In addition it enables the writer to understand the reasons behind decisions made. The opinion of Elites, adds depth to otherwise sterile statistics. Statistics can explain certain movements, but often certain statistics need explanation. There was a massive spike for example in the employment of Welsh Water, because all of the services which were outsourced were subsequently in-sourced and previously outsourced workers started to work directly for Welsh Water. After meeting the founder of Welsh Water it was clear that this was a strategic move to reorganise the company and support the staff who felt alienated from the ethos and values of Welsh Water, (the result was an increase in employee morale). The reason for the statistical change may have been obtainable by the mere study of employment statistics, the in-sourcing of previously outsourced staff. The reason why the staff were insourced and the result that this had on their morale would however have

been impossible to ascertain if the methodology of elite interviewing was not employed. Many opinions are not in print as many academics have not interviewed these experts. In not interviewing elites the opinions of why certain things happened cannot be recorded. Recording such opinions brings a more comprehensive approach to the work and adds the dimension of human reasoning which allows one to better understand the statistics being studied.

Satisfaction

Seidman[130] in his work states that interviewing is the best way to make '*meaning through language'* and additionally and importantly it brings satisfaction to the individual who is composing the work. Interviews have not only put context to the data, but insight and understanding of the physical process of provision, in so doing this has increased understanding and the satisfaction in writing.

[130] Seidman, "I*nterviewing as Qualitative Research*" Teachers College Press, 2013

Disadvantages

Time

It is very time consuming obtaining interviews. The full process is detailed below. From Identifying the elites to actually incorporating the interview (if one was provided) is a long segmented process. Identifying an elite and contacting them can consume one full working day and that may not result in an interview. Many individuals or organisations were unwilling to interview or did not respond. If an interview has been approved the time required depends on how the interview is carried out, if for example the interview is to be in a certain location then on average a day is used for the interview. If however travel is involved (Wales and England from a base in Scotland) then this can extend to two or three days. Before the interview a considerable amount of research needs to be done into the organisation and individual who will be interviewed and the questions that should be asked. After the interview has taken place the transcript must be written and then relevant sections incorporated into the work and analysed. The time taken to obtain the interviews is however not outweighed by the invaluable information which the interviews provide.

Unable to help / no answer

One of the major obstacles in collecting first hand experience is that not only is there a reliance on the individual providing credible information, but there is a reliance on individuals providing interviews. The interviews were carried out over a four year period and it was clear that those in the corporate sector were more willing to be interviewed than those in particular in charitable organisations. It is the case however that many non corporate and charitable institutions were contacted, it was simply the case that more organisations needed to be asked in order to obtain interviews. Charitable organisations interviewed include; The Association of Rivers Trusts, Water.Org and The Scottish Wildlife Trust. [131] In comparison eight out of

[131] Those organisations contacted who did not provide an interview include but are not restricted to: The Royal Society for the Protection of Birds, The Green Alliance, Campaign for Rural England, The Chartered Institute for Water and Environmental Management, The British Association of Nature Conservationists, The Conservation Foundation, The Tree Council, Friends of the River Kelvin, Environmental law Foundation, Environmental Protection UK, Global Action Plan, The United Nations (Water Department), The UK Environmental Law Association, The Environment Agency, Water Commission for Scotland (WICS), The Environment Agency and the Scottish Environment Protection Agency.

the eleven water providers (Including Welsh Water and Scottish Water) in Great Britain provided interviews.[132]

Bias

As May highlights; " *Interview yields rich insights into people's biographies, experiences, opinions, values, aspirations attitudes and feelings."*[133] It also may be tainted by bias towards a particular belief, stance or organisational mantra. Thus the data must be interpreted in such a format that the bias is recognised and the facts where possible are verified and separated from opinion.

Lilleker[134] comments that the most difficult section of Elite Interviewing is how to interpret the data. He states that different individuals have different perspectives on different events. He then goes on to state that there is only one true safeguard for this situation and that is the corroboration of facts. Lilleker highlights the concept of triangulation, which was used in this

[132] Anglian Water, Severn Water and Northumbrian Water were the three water companies who did not provide interviews.
[133] May, T "Social Research Issues, Methods and Process" Open University Press, 2001
[134] Lilleker, "*Interviewing The Political Elite: Navagating a Potential Minefield." Politics (*Or *"Doing Politics"), Vol 23 (3), 2003*

Thesis and is discussed further in this chapter, which is a technique used to verify statements made with factual evidence. Many topics do not have the luxury, which is provided to the analysis of a regulated industry. Water providers are obliged to provide information on a variety of issues including; company returns, customer prices, sustainability plans and pollution incidents. Therefore it is possible to verify the statements made (and facts provided or stated) by the elites, and in relation to each interview this has been accomplished. The documents provided to the regulators such as the Environment Agency or The Water Services Regulation Authority (Ofwat) by the companies and the information in company documents has however been taken as valid as the publication of fraudulent information is an offence.

Appropriateness of Method

Identifying (Defining) Elites

The term elite is very subjective. Particularly it was found that when explaining the term of elite interviewing to many being interviewed, they would often laugh or make some self-depreciating comment. Thus although

for example they may be the Chairman, with no direct superior, elites were often amused by this term. This may be related to a British sense of humour, where any form of praise is usually met with some form of flippant remark as a cultural norm. There is no accepted definition of 'elite' and some academics have been known to separate those who are deemed to be elite in their field from 'ultra elites'. Zuckerman[135] separates those whom she believes to be elite from 'ultra elite,' a distinction, which this work deemed to overcomplicate the analysis. McDowell defined elites as '*Highly skilled, professionally competent and class specific*.[136]' This is the definition, which this work shall also use. It was considered to change this definition to incorporate individuals who have a position where one would presume knowledge, that was in reality lacking, for example an individual in an elite position without elite knowledge. There was reassuringly no need to do this as all who were interviewed held considerable amounts of knowledge in their field.

[135] Zuckerman, HA " Interviewing the ultra elite. The Public Opinion Quarterly, 36, 159 – 175, 1972.
[136] McDowell, L "*Elites in the City of London: some methodological considerations*." Environment and Planning A 30:2133-2146, 1998

Contacting Elites

After identifying the elites (which could often take considerable time) they needed to be contacted. This was done either through email, letter, telephone or a personal introduction. In certain instances there was a series of communications between personal assistants or junior operators before there was a possibility to actually contact the elite.

Preparation for Interview

In preparation for the interview Thomas[137] recognises that it is very difficult to gain access to elites and once access is gained it is important to make the most of the event. He highlights several ways in which one can optimise the experience. Firstly ensuring that the interviewer knows why they are being interviewed, for what and if they are being interviewed as an individual or as part of the organisation. This was done in this study with each elite. Thomas also states that the interview must be controlled in some way through the use

[137] Thomas, Robert "*Interviewing Important People in Big Companies*" from Hertz, Rosanna, et al, "*Studying Elites Using Qualitative Methods*" Sage 1995

of structuring the questions correctly. Importantly he highlights the fact that the encounter can provide not only verbal information but can be supplemented by other data from the individual or organisation.[138] Every organisation (or elite) provided supplementary information when requested and many answered multiple requests and questions, in particular Ofwat, with whom there were multiple communications.

Interviewing Elites – Format of Interviews

There are four types of interview: The Structured Interview, leaves little or no room for prompting or improvisation but is highly structured to ensure consistent questioning. The semi-structured interview, has flexibility for probing the interviewee with supplementary questions, yet has a framework round which the questions are based. The open interview is more of a roaming free conversation than a structured series of questions. In addition there is also the focus group, which simultaneously collects ideas in an open format from a group of people.[139]The interviews collected in this Thesis ,

[138] There are several works which are seminal in the interviewing process and include a variety of different techniques to aid interviewing, including the works by; Seidman, Hertz, Kvale and Wengraf, All of which are fully referenced below and in the list of references.
[139] Noaks and Windcup, " Understanding Qualitative Methods" Sage, 2004

were semi structured using mainly open-ended questions. This technique is one, which has been utilised to interview elites and has many advantages. May stated that semi-structured interviews allows the interviewee to answer more on their terms than opposed to a structured interview, but still retains elements of formality[140].

Miles and Huberman comment that the researcher who restricts their work to a finite number of ideas and questions will restrict the validity of the results rendered. They recognise that no researcher will begin with a *tabula rasa* mind, but the usage of deliberately general research questions, in addition to more specific questions when required, will produce a more thorough data collection process.[141] In this study though there were questions presented to the subjects, most were general enough to allow the interviewees enough flexibility to respond fully to the question within a relative structure. When needed specific questions were asked to allow the collection of numerical data. Aberbach[142] while advocating such form of structure highlighted several considerations to its use. The manner of open ended general questions is best where specific mathematical data is not required. Such data

[140] May, T "Social Research Issues, Methods and Process" Open University Press, 2001
[141] Miles and Huberman, "*Qualitative Data analysis*" Sage, 1994
[142] Aberbach, Joel and Rockman, Bert, "*Conducting and Coding Elite Interviews*" Political Science and Politics Volume 35, p 673-676, December 2002

was not required, but subsequently after the interview many interviewees provided data which was specific and numeric, for example Ofwat. Open ended questions give the respondents flexibility to provide the information in the format of their choosing and thus one may receive additional information that would not otherwise have been obtained. The interviews which occurred, particulary on the telephone or in person did follow this structure where the interviewer did expand on one point and provide information voluntarily (or through probing). On certain occurrences it was necessary to use certain techniques such as 'bridging'[143] to redirect the interview. Aberbach observed that Elites preferred open ended questions, this was also noticed in this study. An example of an open ended question would be ' What do you consider to be the biggest threat to the water industry in the future? ' This contrasts with an example of a closed ended question such as ; '*Rank from 0 to 10 the how important the following are in the provision of water to domestic customers'*.[144]

[143] Defined below.
[144] For a further discussion and examples of both open and closed questions see: Harvey S, " Strategies for conducting elite interviews" Qualitative Research, 11:431, 2011

Transcribing and Incorporation

Kvale comprehensively narrates the process of transcribing from the oral interview to written form and states that this is in itself the initial analytical process[145]. Each Interview[146] was fully transcribed and in full as can be seen in Appendix 1. In addition to this certain elements of the most pertinent interviews have been incorporated within the Thesis which then analyses the comments made.

Techniques

Seidman titled a chapter in his work ' *Technique isn't everything, but it is a lot*.'[147] This statement summarises aptly the importance of technique. There are various techniques, which one can adopt when interviewing elites many of which are explained by Seidman. The explanation of the target elites is

[145] Kvale and Brinkman, "*Interviews, Learning the Craft of Qualitative Research Interviewing*."Sage, 2009. For more information on Transcribing and subsequent analysis see: Wengraf T, "Qualitative Research Interviewing" Sage, 2012.
[146] With the exceptions to the few interviewees who did not want their interview incorporated.
[147] Seidman, "I*nterviewing as Qualitative Research*" Teachers College Press, 2013

very important. Introducing why you want to do what you want to do and what the information in the interview will be provided for[148]. In this study many of the elites were willing to contribute towards the study. During the interviews certain techniques were also valuable particularly building rapport (a technique promoted by Ostrander[149]), building rapport is important during the interview and importantly one may have to build rapport with their staff in order to obtain an interview. Techniques can also be used to overcome certain obstacles in interviews. One problem which this study found would regularly occur was that elites would deliver monologues, sometimes about something which was not that relevant to the question asked, or indeed the topic. This problem has been commented on before and is not novel to elite interviewing; "*The problem with monologues certainly occurred during my interviews with some quite forceful politicians determined to advocate their well known positions*.[150]" Such monologues if not disturbed can waste time and time is usually a limited resource when interviewing elites. In order to optimise the experience and gain as much information as possible it is necessary to stop the monologues without

[148] Goldstein, K, "Getting in the door: Sampling and Completing Interviews." Political Science and Politics 35 (4)
[149] Ostrander SA, "*Surely you're not in this just to be helpful. Access, rapport, and interviews in three studies of elites*." Journal of Contemporary Ethnography 22 (1) 7- 27.
[150] McEvoy Joanne, " Elite Interviewing in a Divided Society: Lessons from Northern Ireland." Politics: 2006 Vol 26(3), 184- 191

vexing or insulting the interviewee. This can be done by what Berry terms as 'Bridging' which is a method which returns the interviewee (when they have strayed off point) to the question asked or another relevant issue of the main topic. This is done by asking a 'bridging question'.[151] A useful technique, which this work benefited from greatly.

Reliability of Interviews

"*We have a purpose in requesting an interview but ignore the reality that subjects have a purpose in the interview too: they have something that they want to say. Consciously or unconsciously, they have thought about they want to say in the period between the request and the actual interview. They're talking about their work and, as such justifying what they do. That's no small matter.*"[152]

Berry then goes on to minimise the aforementioned problem and increase both the validity and reliability of elite interviews. Firstly it is important to have multiple sources. Thus it is important to speak to a variety of different

[151] Berry, Jeffrey, "Validity and Reliability Issues in Elite Interviewing" Political Science and Politics Volume 35, Issue 04
[152] Berry, Jeffrey, "Validity and Reliability Issues in Elite Interviewing" Political Science and Politics Volume 35, Issue 04

elites, preferably at a similar level or position to obtain a broad range of perspectives. Secondly Berry suggests that the subject 'critique their own case [the interviewee's] ', but without aggressively challenging their views. Or by asking a supplementary question so that they extrapolate their position. This can only be done, as Berry fails to mention, if certain variables are in place. (The interview would need to be in person, on the telephone or if written through email or letter done through supplementary questions.) Berry usually asked around eight open-ended questions, he felt that this gave him the opportunity to probe (or indeed not) depending on how the interview was proceeding. He used the technique of probing which when afforded the opportunity to do so I also utilised. Probing allows the interviewer flexibility to respond to and gather additional information on specific matters. This is a very non-aggressive yet useful way to extract information from the interviewee.

This study found that asking open ended more general questions, combined with the use of various techniques such as bridging, enabled the interviewee the freedom to digress on to other issues when was relevant or required, but it generally allowed the interview to follow a structured line of questioning. This study used multiple sources and did when it was appropriate ask certain

questions, which allowed the interviewee to give more details of their position without asking questions, which may have had a negative impact towards the relationship between interviewee and interviewer. Once the information has been gathered the next step is that it must be analysed.

Data Analysis and Triangulation

Davies[153] supports a method called triangulation, which is a method which corroborates facts or opinions which are mentioned in an interview through the use of other sources. Thus the interviews are verified through the use of counter evidence. Information from an independent source is counter checked with a variety of sources including; other interviews, published first hand accounts and published documents in addition to further secondary sources. This countercheck allows the source's information to be seen as valid or indeed invalid.

It is difficult to triangulate the explanation of for example an increase or decrease in one statistic, however one can verify the increase or decrease.

[153] Davies, Philip, " *Spies as Informants: Triangulation and The Interpretation of Elite Interview Data in the Study of Intelligence and Security Services."* Politics, Vol 21 (1), 2001

For example; Welsh Water stated that; "*In Wales the number of blue flags have increased through the environmental improvements of the water, shoreline and beach*." This statement can be verified with the statistics Welsh Water are legally obliged to provide to the Welsh Environment Agency and with the independent organisation who issues blue flags. The cause behind the environmental improvement will be a combination of factors, to what extent one factor had more of an impact than other factors is difficult to monitor and this work accepts that limitation.

In addition to counterchecking statements it is also important to understand that there must be a form of analysis. Such analysis (in addition to the counter checks which can more readily be done with facts provided in an interview) will scrutinise the opinions of the interviewee and their bias. In taking interviews it should be noted that there are unavoidable prejudices and a reflective objectivity should be considered when analysing the interviews. Kvale and Brinkman[154] discuss bias, objectivity and the importance of analysis. They state that analysis is validated when the researcher not only confirms the facts but also plays devil's advocate towards certain positions held. This Thesis determines to do this by

[154] Kvale and Brinkman, "*Interviews, Learning the Craft of Qualitative Research Interviewing*."Sage, 2009

analysing the major interview positions after they have been stated in the thesis by commenting on the information provided. In doing so it endeavours to verify both the factual information and challenge the verbal positions made during the interview process. Much of the information provided in the interviews can also be verified and triangulated through the analysis of for example water statistics provided by the regulators or government agencies thus information is not used without verification.

Conclusion

Elite interviewing has enabled the collection of first hand empirical evidence, which would have been impossible by any other means. These elite interviews have been corroborated, validated and supplemented with additional information and statistics, which are pertinent to the Thesis . Elite interviewing has provided a holistic approach to the Thesis and has uncovered not only new factual information, but the thoughts of those at the top of the industry. Understanding why is not always obvious or possible when analysing and dissecting facts or statistical movements, this gap of knowledge was filled by the interviews with elites. Elite interviewing has brought a completely unique and insightful understanding and has enabled

matters to be studied comprehensively, not only with new data, but by providing information which explains old data. The reasons behind decisions made, the impact those decision have had and the focus of future decisions are just some examples of what elites provided in addition to contributing unpublished information and invaluable personal experience.

Chapter 3

The Transformation to Privatisation

Introduction

This chapter describes the background and development of the private water model, which is currently present in England and Wales. The information provides a historical account of the shift from Nationalisation to Privatisation.

The chapter will also explain why Nationalisation was initially popular yet eventually unsuccessful. Nationalisation's failure and the decline of Great Britain brought a new wave of Government, this decline and transition shall be described. The rise of Thatcherism and the move towards privatisation shall also be examined.

Privatisation to Nationalisation

Britain's discernable dominance in shipbuilding, metallurgy and trade are just some of the factors why Britain and London prospered[155]. This prosperity was however paired with a swell in population and pollution, which made urban living conditions abominable. The result was what is termed the "Sanitary Awakening", which was a public health revolution that would eventually spread throughout the developed world. The private provision of water is not however a modern concept and large scale private provision was established before public provision, indeed the concept that water has predominantly been provided as a public service is relatively novel.

In London in the fifteenth century water was distributed in buckets by private water carriers, these water carriers by 1496 had reached such professional importance that they had their own trades guild. Water was also

[155] Ferguson, Niall "*Empire"* Penguin, 2004

carried throughout London by pipes[156] and water could be drawn by individuals free of charge, but businesses were charged a maintenance fee. London's sole long distance water transference project was a private project started in 1613 to meet an Elizabethan population boom.[157]

Municipal ownership has and more importantly had huge advantages. The main advantage was that a municipality could focus on the health of the residents above all other factors of provision including price. The provision of inadequate water is obviously dangerous for the residents of the municipality and costly for the municipality. Water carried diseases including Cholera and Typhoid. Cholera epidemics were common across Great Britain and Europe, in 1848 between June and November 13,584 deaths were reported in London alone[158]. The worst outbreak arrived a year later in 1849.

The need for clean drinking water is greater than any other if a country is to avoid water carried disease. The cholera outbreak of 1849 killed 33,000

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[156] Predominantly made from clay, wood or lead.
[157] Solomon, Steven "*Water, The Epic struggle for Wealth Power and Civilization*" Harper Collins, 2010
[158] E Underwood, "*A History of Cholera in Great Britain*" Proceedings of the Royal Society of Medicine Vol, XLI, 165 (http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2184374/pdf/procrsmed00524-0035.pdf)

British citizens and was a drastic and deadly example of how polluted water supplies can lead to epidemics. Although the need for clean water is now considered essential to prevent such outbreaks, when John Snow first published his hypothesis on Cholera and its link with water it was not initially accepted.[159]

The solution, once it was accepted that there was the link between certain diseases such as Cholera and water, was to produce a cheap and environmentally friendly way of purifying the water. This was devised by the Scottish engineer Robert Thom, who designed and constructed the first slow sand filter. This filter cheaply and effectively filtrates the water from the pollutants, removing up to 99% of bacteria. It was so successful that it was made obligatory in Britain in 1852 at a municipal level and indeed the system is still widely used across Britain and the World.[160] Since the realisation that unclean water caused the outbreak of 1849, Britain has treated the provision of water as the essential resource that it is.

[159] Bingham et al, "*John Snow, William Farr and the 1849 outbreak of cholera that affected London: a reworking of the data highlights the importance of water supply*." Public Health (2004), 118

[160] Strathclyde People Magazine November 2009, Municipal Water Filtering article on Robert Thom (1774-1847)

Before 1870 it was difficult for municipalities to establish municipal provision, as they each needed the backing of a Bill passed by Parliament, which was not only time consuming to obtain, but the approval could be contested by private parties. In 1870 The Gas and Water Facilities Act enabled municipalities to establish provision by a 'Provisional Order', which was far simpler to procure. In 1875 The Public Health Act was passed. This enabled the municipality to establish lease or purchase provision from a private supplier if it was deemed that the private supply was not 'adequate'[161]. The primary problem with provision was that it was not adequate, and thus this caveat did not obstruct municipal ownership, indeed by 1907 81% of water companies were public.[162] Thus there was a move from almost complete private ownership to almost complete public ownership.

This move was soon to come full circle from private to public and returning to private, however the type of privatisation was completely different from the previous private provision.

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[161] Foreman-Peck, J "New Perspectives on the Late Victorian Economy" Cambridge University Press, 1991

[162] Foreman-Peck, J and R Millward "*Public and Private Ownership of British Industry 1820-1990*" Claredon Press, 1994

Human Victory and Economic Decline

Allied victory over Germany in WWII, was by no means Pyrrhic, but it was obtained at a heavy cost to the Allies including Great Britain. Almost half a million British soldiers[163] and civilians were lost. The Second World War wrecked the unstable remains of the 'War to end all Wars.[164]' The people of Britain wanted change, a new system of order that encompassed the social unity, which was fostered during the previous six years of struggle. The first step was to elect a new Government, the second was for that Government to implement nationalisation.

"*When I left Potsdam on the 25th of July, 1945, I certainly expected that the election figures would leave me a reasonable majority, and it was startling to be confronted with the facts. Entirely absorbed as I had been in the prosecution of the war and the situation at its victorious close, I did not understand what had taken place in the British Isles.*[165]"

[163] In addition many Commonwealth and Allied troops including American died.
[164] World War I.
[165] Churchill, Winston, "*Memoirs of the Second World War*." Epilogue, 1995, Houghton Miffin Company.

What had developed on the British Isles was a strong desire for change. The beginning, of a new beginning. Not even Churchill's revered and loved standing could prevent his political defeat and the following wave of nationalisation.

The 1945-1951 Labour Government led by Clement Attlee nationalised many industries including; coal mining, The Bank of England, civil aviation, railroads, road haulage, electricity, gas, iron and steel. Water was and remained in the control of the state.

The financial toll of two World Wars was evident in post war Britain. Economically the country had never fully recovered and years of poor financial management and inadequate national production, was evident. Both Conservatives and Socialists conceded that Great Britain, once at the epicentre of the greatest Empire the world had ever known was crumbling. There were many reasons why Britain declined: Trade Unionism has been allotted considerable blame[166] and had been strengthened by years of political support towards nationalisation; poor productivity since the war

[166] Nickell, S and Andrews M "Unions, real Wages and Employment in Britain 1951 – 1979" Oxford Economic Papers 35 (183-206) 1983.

also substantially contributed.[167]

In 1979 The Labour Government ceded power, to the Conservatives (who had a majority of 44 seats), led by Margaret Thatcher[168] and the country again demanded change. Financially Britain was sinking.

When the new Conservative government entered into Downing Street they were burdened with heavy deficits, economic recession and manifesto pledges to maintain spending in the National Health Service and increase spending on other sectors including Defence and the Police. Publicly owned industry was placing a large pecuniary strain on the country. The Unions however prevented previous governments from liberating the industry from public administration. Indeed the Unions were in a large part responsible for the collapse of a previous Conservative Government in 1974.[169]

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[167] Maddison, A "*Growth and Slowdown in Advanced Capitalist Countries: Techniques of Quantative Assessment"* Journey of Economic Literature, 24 (649-98) 1987

[168] Mrs Margaret Thatcher was the Prime Minister of The United Kingdom of Great Britain and Northern Ireland from 4 May 1979 to 28 November 1990. She is now The Baroness Thatcher, LG, OM, PC, FRS and sits as a Peer in the House of Lords.

[169] Newbery, D "*Privatisation, Restructuring and Regulation of Network Utilities*" MIT Press, 1999

Shift in Economic Theory

The economic changes that occurred in the 1980s were a culmination of a variety of factors including poor economic growth, rising inflation, Mrs Thatcher and Thatcherism. During this time there was an economic shift from Keynesianism to Monetarism. Advocates of Keynesianism view the market as an unstable and volatile instrument, which is reliant upon economic rigidity, fiscal adjustment and state intervention[170]. Monetarists believe that government intervention disrupts the natural cycle of the market and hinders its progress.[171]

"During the second half of the 1970s Monetarism challenged Keynesianism as the dominant force in macroeconomics. The impact of this is difficult to exaggerate. Under the influence of Keynesian economics, governments in the post war period had felt obliged to intervene in the economy by pump priming aggregate demand whenever a recession threatened… By contrast, the central tenet of Monetarism was that inflation was the result of monetary expansion or, more simply , " printing too much money". Inflation would

[170] Blinder, A The Concise Dictionary of Economics (http://mysite.avemaria.edu/gmartinez/Courses/ECON201/pdf/Keynes_NewClassical.pdf
[171] Business Dictionary.com (http://www.businessdictionary.com/definition/monetarism.html)

only be brought back under control and the conditions for more real jobs created by controlling the money supply, and in turn this necessitated restraint in government borrowing. Monetarist economics would be important in determining budgetary policy after 1979. During the second half of the 1970s the Conservative Party leadership embraced monetarism …Economic Theory provided an important intellectual underpinning for privatisation."[172]

Monetarism was not initially the most popular view by academics or economists, the majority of whom still advocated Keynesianism[173]. Politically Monetarism was seen as a popular way to end the impotent stance of previously Union dominated governments and allow politicians to follow a system, which was the complete opposite of the now unpopular previous Labour administration. " *By the end of the 1970s, a decade of tortuous negotiations over incomes policies had rendered both the trade unions and neo-corporatist arrangements increasingly unpopular. The government seemed impotent in the face of continuing economic problems and powerful unions. Monetarism offered a simple but appealing prescription for all of*

[172] Parker D, "*Official History of Privatisation*" 2009, Routledge
[173] Hall, P "*The Political Power of Economic Ideas: Keynesianism across Nations*" Princeton University Press, 1989

these dilemmas. Its advocates argued that the government could discipline the unions and eliminate inflation, the most serious economic problem of the 1970s, simply by adhering to a strict target for the rate of growth of the money supply. . . In short, Monetarism was presented as a doctrine that could restore the authority of the government as well as resolve Britain's economic problems.[174]"

The Problems with Nationalised Industry

"*In general the nationalised industries' performance has been third rate.*"[175] Those in favour of nationalised industry were in favour of their State control. To have this control removed from the State to independent businesses would and did divest the state of its power and control over the industries. Synonymous with the concept of denationalisation (or privatisation) was that of Margaret Thatcher[176] and now what is known as Thatcherism.

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[174] Hall, P "*Policy Paradigms, Social Learning and the State* " Comparative Politics, 25, 3 (275-296) 1993

[175] Pryke, R, "*The Nationalised Industries: Policies and Performance Since 1968"*1981 Oxford.

[176] Mrs Margaret Thatcher was the Prime Minister of The United Kingdom of Great Britain and Northern Ireland from 4 May 1979 to 28 November 1990. She is now The Baroness Thatcher, LG, OM, PC, FRS and sits as a Peer in the House of Lords.

In 1979 The Labour Government ceded power, to the Conservatives (who had a majority of 44 seats), led by Margaret Thatcher and the country demanded change. Financially Britain was sinking, privatisation was the solution the Thatcher Government gradually embraced.

Thatcherism[177]

Thatcherism is an emotive word, which evokes a polarised response in the British Isles. One of the key aspects and principles driving Mrs Thatcher was individual responsibility and individual ownership. There is no greater manifestation in this principle than the promotion of individual share ownership in previously owned public sector enterprises.

"*Economics are the method; the object is to change the heart and soul.*" [178]

Thatcherism and the following privatisation combined financial beliefs with a change in ideological principles. Although the Conservative party eschewed following a certain path due to ideology in isolation, the economic

[177] For more information on Margaret Thatcher including full speeches and interviews see: The Thatcher Institute: (http://www.margaretthatcher.org/essential/default.asp)
[178] Thatcher, Margaret, Interview for The Sunday Times, 1 May 1981.

pragmatism and entrepreneurial advantage behind privatisation, was in itself great enough to make privatisation become as close to an ideology as the Conservatives would have. Privatisation was not the initial banner for the Thatcher administration, but it did become so.[179] Nigel Lawson[180], The Chancellor between 1983 – 1989 states that it was not the initial intent of the government to privatise indeed stating that ; "There were never any plans for the wholesale transfer of public services to the private sector."[181] However he stated that " *Privatisation was a central plank of our policy right from the start*."

"*Understanding the success of privatisation as a policy lies in large part in appreciating how it grew from a piecemeal approach into something more comprehensive. It was the initial successes of relatively small scale sell-offs and modest liberalisations that emboldened the government to go further*."[182] However Lawson reveals that the reluctance to outline Thatcher's

[179] Gamble, A "*Privatisation, Thatcherism and the British State*" Journal of Law and Society, 16, 1989
[180] Now Lord Lawson Baron of Balby.
[181] Lawson N, "The View from Number 11: Memoirs of a Tory Radical" 1992, Bantam Press
[182] The Privatisation of British Telecom, Institute for the Government, 2010: (http://www.instituteforgovernment.org.uk/sites/default/files/british_telecom_privatisation.pdf)

privatisation policies had been held back as a result of "*Margaret's understandable fear of frightening the floating voter*."[183]

Privatisation was not traditionally a Conservative concept. It was not publicly advocated before the 1979 election[184] nor was it supported by senior Conservative figures. When privatisation commenced Harold Macmillan stated that it was analogous to, '*Selling the family silver*.'[185]

The Conservative administration outlined five main objectives, which highlighted the principles behind privatisation:

1 To promote competition and free enterprise.

2 To reduce the size of the considerably large British public sector.

3 To incorporate and involve staff into companies.

4 To encourage share ownership among the public and increase those who own shares.

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[183] Lawson N, "The View from Number 11: Memoirs of a Tory Radical" 1992, Bantam Press

[184] With the exception of the recently nationalised aerospace and shipbuilding concerns, which the 1979 manifesto did state that it would '*sell back to private ownership*'.

[185] Harold Macmillan was a Conservative Prime Minister from 10 January 1957 – 18 October 1963 and was later to become the Earl of Stockton, OM, PC.

5 To release the State controls on enterprise.[186]

"Privatisation, no less than the tax structure, was fundamental to improving Britain's economic performance. But for me it was also far more than that: it was one of the central means of reversing the corrosive and corrupting effects of socialism. Ownership by the state is just that – ownership by an impersonal legal entity: it amounts to control by politicians and civil servants; and it is a misnomer to describe nationalisation, as the Labour party did, as 'public ownership'. But through privatisation – particularly the kind of privatisation which leads to the widest possible share ownership by members of the public the state's power is reduced and the power of the people enhanced.' [187]

What the Thatcher Government realised was that what once were considered to be assets had transformed into massive financial liabilities.

[186] Kato, Tapio and Hukka, Jarmo, "*Refuting the paradigm of water services privatisation*" Natural Resources Forum, 27, (2003) 142-155, Blackwell Publishing.
[187] Thatcher M, "*The Downing Street Years*" Harper Collins 1995

Privatisation was not born through non political pressures, either financially or publicly related but a combination of two factors, the broad concept of ideology and the narrow concept of finance.

'*The narrower economic arguments for privatisation were also overwhelming. The state should not be in business. State ownership effectively removes – or at least radically reduces – the threat of bankruptcy which is a discipline on privately owned firms. Investment in state owned industries is regarded as just another call on the Exchequer, competing for money with schools or roads. As a result, decisions about investment are made according to criteria quite different from those which would apply to a business in the private sector.*'[188]

The public sector was evidently lagging behind that of the private sector and growth in the term of profit (excluding state subsidies) were negative, in short there was a loss.[189]

[188] Thatcher M, "*The Downing Street Years*" Harper Collins 1995
[189] Pryke, R, "*The Nationalised Industries: Policies and Performance Since 1968"* 1981 Oxford.

British Telecom became the first major state flotation and was initially promoted by Sir Keith Joseph[190], who was then Mrs Thatcher's close advisor and Minister for Trade and Industry. Sir Keith, who was impressed by the deregulation of telecoms in the United States advocated privatisation. He argued that privatisation would remove the power of the public sector unions and reduce the public borrowing which would have been necessary if the industry were to remain private.

Water was privatised ten years after British Steel, which economically was a prime example of economic success. In 1979 under national control it was losing the taxpayer £30 per second and by 1989 (privately owned) it was producing just as much steel, with one third of the labour force and was considered highly successful.[191] From privatisation the government negated their ongoing loss and between the years of 1977 and 2000 the Government had privatisation receipts, which totalled around £71.4 Billion[192]

[190] Now The Lord Joseph, Bt, CH, PC.
[191] Flint Carl, Pugh Peter, "*Thatcher*", Icon Books, Cambridge, 1997
[192] Calculated from information in: Parker D " The UK's Privatisation Experiment: The Passage of Time Permits a Sober Assessment" Conference on Privatisation Experience on the EU. The Working paper can be viewed below: (http://www.ifo.de/portal/pls/portal/docs/1/1189348.PDF)

Many industries had been successfully privatised; British Telecom, British Steel and British Airways. The privatisation of the water utility market appeared to be the correct political and economic move.

By 1990 42 major public services employing around 900,000 had been privatised.[193]Ten years after Mrs Thatcher had become Prime Minister the Conservative Government had sold over half of Britain's nationalised sector and raised over £45 Billion.

In July 1992 seventeen previously public organisations, now private corporations, were quoted in the top 100 UK companies and had a combined share valuation of £80 Billion. Between 1979 and 1991 public corporate capital reduced from 40% to 10%, and reduced the state ownership in industry by around 60%. This was the greatest transfer of assets from the public to the private sector outside the communist bloc[194].

"*I was always especially pleased to see businesses which had absorbed huge sums of taxpayers' money and been regarded as synonyms for Britain's*

[193] Foreman-Peck, James, "*How Privatisation has changed Britain*" BBC News, Friday 3 December, 2004 (http://news.bbc.co.uk/2/hi/business/4061613.stm)
[194] Newbery, D "*Privatisation, Restructuring and Regulation of Network Utilities*" MIT Press, 1999

industrial failure pass out of state ownership and thrive in the private sector." [195]

The privatised firms included; British Telecom, British Airways, British Gas, British Steel and importantly the Regional Water Authorities for England and Wales. [196]

Regulation and Governance

The Thatcherite regime is notable for the liberation of public provision into private enterprises. It has however constrained the market by establishing different organisations which indirectly increase the central powers of the state, indeed centralise to decentralise.

One consistent and important institution, which was established was the regulatory body. These bodies were provided with great powers and responsibilities to govern the operations of the utility providers. The establishment of Oftel, the regulatory body governing the

[195] Thatcher M, "The Downing Street Years" Harper Collins 1995
[196] Pint, Ellen, "*Nationalization and Privatisation: A Rational-Choice Perspective on Efficiency*." Journal of Public Policy, Volume 10, No 3 (July – Sep, 1990) pp 267 - 298

telecommunication system became the model for the subsequent regulators. Ofgas was established when the Gas sector was privatised, Offer was established for electricity, these two bodies have now been merged into Ofgem (The Office of Gas and Electricity markets), the railways are also regulated, initially by an organisation called Orr but now are also governed by the Strategic Railway Authority. Importantly water is also regulated by Ofwat.

One of the ways in which continuity has been maintained within the regulatory framework when privatisation was established was through price restrictions. The measures vary from industry to industry but the principal is constant in that utilities should be at an affordable price and profits for individual companies should not be gained at the expense of the individual.[197]

British Telecom price regulation was calculated through the formula RPI (retail Price Index) minus 3% (and this remained static for five years until it was changed to – 4.5% for two years). British Gas was calculated through

[197] A detailed explanation of the price calculation of water can be seen later in the text.

the formula RPI – 2% from privatisation in 1986 which remained the rate until it was changed six years later to RPI – 5%.[198]

Table 3

The Privatisation Timeline[199]

Industry	Date of Initial Sale[200] / subsequent sales.
British Petroleum	1979 (1983 & 1987)
British Aerospace	1981 & 1985
Jaguar	1984
British Telecommunications	1984 (1991 & 1993)
British Shipbuilders and Docks	1985
British Gas	1986
British Airways	1987
Rolls Royce	1987

[198] Parker, David " Privatisation Ten Years On: A Critical Analysis of its Rationale and Results" Cranfield School of Management (Report) 1991

[199] Information to collate Timeline gathered from Parker D " The UK's Privatisation Experiment: The Passage of Time Permits a Sober Assessment" Conference on Privatisation Experience on the EU. The Working paper can be viewed below: (http://www.ifo.de/portal/pls/portal/docs/1/1189348.PDF)

[200] In many cases Privatisation was done in stages over a period of years with batches of shares being sold to the market.

British Airports Authority	1987
British Steel	1988
Multiple Regional Water Authorities	1989
Multiple Regional Electricity Boards	1990

Benefits of Utility Privatisation

Electricity

There was a reduction in the end user bill between 1990 and 1999 of between 25 – 34%. This varied depending on the site or outlet supplied, with small sites having a saving 30%, medium sites 34% and extra large sites saving 25%.[201]

Costs also fell dramatically between 1994 – 1998 the cost of production and distribution of each unit of electricity fell in real term by 28%.[202]

[201] Littlechild S, " *Privatisation, Competition and Regulation*", Occasional Paper, 110 London Institute of Economic Affairs, 2000, British Library Serials – ISSN 0073 909X
[202] Domah and Pollitt, " The Restructuring and Privatisation of electricity distribution and supply Businesses in England and Wales: A Social Cost – Benefit Analysis." Fiscal Studies (2001) Vol 22 No 1:
(http://www.ifs.org.uk/fs/articles/0036a.pdf)

The total net benefit of privatising electricity in Britain is estimated at between £6 and £11 Billion[203] in addition to which privatisation provided the country with substantial environmental benefits as cleaner gas generation replaced old coal powered plants which led to a dramatic reduction in pollutants including sulphur dioxide and carbon dioxide.[204]

Even the PSIRU (Public Service International Research Unit) has conceded the success of the privatisation of electricity provision. "In terms of prices and reliability, the reforms in Britain appear to have been a success."[205]

Gas

An increase in efficient production within the remit of safe and professional provision was the design when implementing the privatisation regime to many utilities including Gas. Efficiency and the provision of it has a variety of different dimensions one of the dimensions is the growth of the provider

[203] The estimate varies depending on how one ascertains the productivity of the Nationalised Industry and if it were to be run more ore less efficiently than in previous years.
[204] Newberry and Pollitt, "*Public Policy for the Private Sector*" Note Number 124, September 1997: http://rru.worldbank.org/documents/publicpolicyjournal/124newbe.pdf)
[205] Thomas S, "*The Impact of Privatisation on Electricity Prices in Britain"* Presentation to the IDEC National Seminar on Public Utilities, 2002, Sao Paulo

which in the case of the Gas industry doubled from around 3 % to 6% after privatisation.[206]

The Customers clearly saw a benefit with a reduction in price (in real terms). A decade after privatisation residential customers who used less than 2,500 therms per year saw a real price decline of between 24 – 27 % per year. For Industry this decline was even greater with a decline of up to 50% per year.[207] As the Department for Energy and Climate Change report[208] in real terms Industrial prices of gas are still beneath those of what they were during national provision and it is only recently, through shortage of supply that domestic prices have risen[209].

Steel

In 1967 the 14 national authorities were merged into one organisation British Steel, from then until 1988, when the British Steel Act was enacted it was run as one National Enterprise. The 1988 Act transferred the assets of the

[206] Waddams, Price and Weyman-Jones, "*Malmquist Indices of Productivity Change in the UK Gas Industry before and after privatisation." Applied Economics, 28, 1996*
[207] Stern J, " *British Gas Market 10 Years after Privatisation: A model or a warning for the rest of Europe?*" Energy Policy Volume 25 Issue 4
[208] Department For Energy and Climate Change – Energy Briefing 2011: http://www.bbc.co.uk/news/business-16916577)
[209] "*Gas Prices rise as freezing weather bites across Europe*" BBC News, 6 February

National Enterprise into a registered company and opened up the company to the stock exchange in essence making it private.[210] In 1980 British Steel made a loss of around £1 Billion and was producing steel, which was three times more expensive than its competitors in West Germany.[211] In years after privatisation British Steel managed to dramatically reduce its loss and increase efficiency.[212]

British Telecom

British Telecom[213] like every privatisation was made possible through legislation, in this case the aptly named Telecommunications Act.[214] This Act separated British Telecommunications from the British Post office and enabled the governmental sale of half[215] of the company, the other shares were sold in future years. A large portion of the shares offered were taken by BT employees who were offered free shares, thus weakening the trade

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[210] The British Steel Act 1988: (http://www.legislation.gov.uk/ukpga/1988/35/contents)
[211] Aylen, J "Privatisation of the British Steel Corporation" Fiscal Studies Volume 9 Issue 3 1988
[212] Sadler D "*Privatising British Steel. The Politics of Production and Place*." Area Vol 22 1990
[213] A history of its evolution can be seen: (http://www.ofcom.org.uk/static/archive/oftel/about/history.htm)
[214] Telecommunications Act 1984: (http://www.legislation.gov.uk/ukpga/1984/12/contents)
[215] Indeed more than half 51%

unions anti-denationalisation stance as their membership (the employees) were on the whole in support of the sale.

After privatisation the real customer prices rose slightly in the following two years then by 1990 they had been reduced by a quarter, and by 1996 they had been reduced by a further quarter. In real terms (deflated by the RPI) in around six years the prices had been halved.[216]

Competition has brought choice and now the share of British Telecomm has been reduced from 100% to 48.2%. It is still the largest provider, with the second largest (Virgin Media) holding only 14.7%. In addition to landlines the internet is also operated through the telephone lines, of which BT would have (under national control) have held 100% but now only holds 27.5% with other large corporations providing various options for customers (Virgin Media 21.5%, Talk 19%, Orange 3.7% and O2 3.3%). This is still a massive reduction of share ownership.[217] It should be noted that in addition

[216] Newberry, David " *Privatisation and Liberalisation of Network Utilities*" European Economic Review 41 (1997) :
(http://www.econ.cam.ac.uk/faculty/newbery/files/istanbul.pdf)
See also : CSO, 1996, Monthly Digest of Statistics, London: Central Statistical Office.
[217] OFCOM Facts:
(http://media.ofcom.org.uk/facts/)

to regulating telephone pricing[218] the remit of Ofcom has widened through the necessity of technological advancement to not only include the monitoring and regulating of lines used for the internet but the quality and the speed of the provision provided.[219]

BAA

British Airports Authority owned and operated six of the largest Airports in Britain[220]. Although Britain had in total around 40 Airports the majority of business was monopolised by the airports owned and operated by BAA; over 70% of passengers and over 80% of cargo.

The Airports Act 1986[221] privatised BAA through the sale of shares. The Civil Aviation Authority in conjunction with Competition Commission regulate BAA.[222] Profits were again regulated independently and were

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[218] The Ofcom remit involves a variety of regulatory duties which in addition to pricing regulation, involves fining corporations who abuse the telephone service by 'cold calling' or to be specific corporations making silent or abandoned calls: "Homeserve Fined £750,000 for silent and abandoned calls." 19 April 2012 : (http://media.ofcom.org.uk/2012/04/19/homeserve-fined-750000-for-silent-and-abandoned-calls/)

[219] "*Ofcom Calls on broadband providers to improve speeds information*." May 15 2012 : http://media.ofcom.org.uk/2012/05/15/ofcom-calls-on-broadband-providers-to-improve-speeds-information/)

[220] These Included: Heathrow, Gatwick, Stansted, Glasgow, Edinburgh and Aberdeen.

[221] The Airports Act 1986: (http://www.legislation.gov.uk/ukpga/1986/31/pdfs/ukpga_19860031_en.pdf)

[222] BAA Webpage:

devised by a unique formula called the 'single till principle'[223] Essentially the single till system forces the owners of the airports to use the highly profitable income of non-aviation business (e.g. duty free shops) to cover the airport costs (and a reasonable profit for the owners), treating the income as a 'co product' between the airport owners and the airlines, as opposed to separating the airport from the airlines which would produce a disproportionate yield to the former and producing lower profits and subsequent price increases for the latter, which in turn would mean consumer price increase and potentially less travel.[224]

Since privatisation there has been an increase in productivity and an increase in the importance (and revenue) of non aviation related products. One of the main reasons for the success has been the regulation and the system of fee capping.

This system of regulation has been popular and successful with both the airport owners and the airlines.

(http://www.baa.com/media-centre/faqs#WhoregulatesBAAsairports)

[223] Explained in detain in: Starkie and Yarrow "*The Single-Till Approach to The Price Regulation of Airports" Civil Aviation Authority, London: http://www.caa.co.uk/docs/5/ergdocs/starkieyarrow.pdf)*

[224] Gerber, "*Success Factors for the Privatisation of Airports – an airline perspective*" Journal of Airport Management 8 (2002)

" *We firmly believe that the single till is the absolute essence of airport charging. Airlines fully endorse the single till concept and accept the restrictions it brings as a trade-off. The activities at an airport are so intrinsically linked, both in terms of operational requirements and cost, that it is not appropriate to look for or to try to justify a purely economic rationale for price control. There has to be recognition of the business relationship between the airports and the airlines. After all, non aeronautical opportunities only exist because airlines operate at the airport."*[225]

Cost of Sale

Selling or privatising the public provision is not an easy nor cheap process. There is money in promotion, administration, and administrative fees. It is the case however that the costs involved are relative to sale prices, small. As an example British Aerospace was sold in an initial stake of (circa 50%) in

[225] BMI – Response to the Consultation Paper set by the CAA dated December 2000, BMI Reply Dated February 2001:
http://www.caa.co.uk/docs/5/ergdocs/till/bmi.pdf)
See Also Response from British Airways (2001):
http://www.caa.co.uk/docs/5/ergdocs/till/ba.pdf

1981 for £149 Million. The remaining shareholdings were offered in 1985 and raised an additional £550 million. The expense of the sale was calculated at £6 million, a small percentage of the revenue gain.[226]

Reasons for Privatising Water

As discussed previously in this chapter politically there were two primary reasons for privatising public utilities and these reasons did not change when considering the privatisation of water. The first broad reason is the ideology of Thatcherism, which encompasses giving power and ownership to individuals, utilising the efficiency of business and reducing the power of trade unionism.[227] The second reason is financial and simply, private sector purchase and provision would not only save the government money in maintenance and restoration but it would provide money in the form of revenue.

"*The single most important benefit that privatisation has brought to the*

[226] Vickers J, " Privatisation an Economic Analysis" Seventh Printing 1997 MIT Publishing

[227] "[*Water was privatised due to] A combination of political drivers to de-politicise large sectors of the economy and hence the power of the Unions and labour and neo liberal ideology and economic theory.*" Interview with Laurie Smith, University of London, See Appendix 1

industry is the ability to utilize private sources of finance to meet substantial funding requirements. By the end of 2012 the industry will have invested over £100 Billion in improvements since privatisation, meeting formidable quality and environmental challenges. Privatisation was driven by the realization that public funding of these improvements would be unlikely to be either viable or efficient and that the required improvement in standards would not be affordable based on increases in customer bills alone. Private finance has therefore acted as a bridge, ensuring that the benefits of improvements can be enjoyed now, funded by small increases in customer bills over an extended timeframe." [228]

There were no other externalities such as industry or non governmental pressures which spurred the privatisation of the utilities, including water. The only other driver at an international level was European Legislation[229] as is discussed later in the Thesis .

[228] Interview with James Bullock, United utilities (UU), See Appendix 1
[229] (The European Commission required the opening up of various markets including telecommunications (European Commission 96/16) and electricity (European Commission 96 /92). Thus in addition to the other reasons there was international pressure and legal obligation to start privatisation.)

Water Privatisation

"*In the 1987 Manifesto both electricity and the water industry were the main candidates for privatisation. So over the years privatisation had moved from fairly low down to somewhere near the top of our political and economic agenda.*" [230]

In 1986 the HMSO[231] published a White Paper[232] entitled "*Privatisation of the Water Authorities in England and Wales*[233]". This advocated the position that the private sector provision of water would reduce governmental interference, cut costs and improve the standard of service.

"*Private enterprise is both more flexible and readier to pursue energetic and innovative approaches than the public sector. The demands of the market will give management and staff the impetus they need to secure greater*

[230] Thatcher M, "*The Downing Street Years*" Harper Collins 1995
[231] Her Majesty's Home Office
[232] This was preceded by a Discussion Paper, which was issued in April of 1985.
[233] HMSO, "*Privatisation of the Water Authorities in England and Wales*" (1986a), White Paper, Cmnd 9734, HMSO, London.

efficiency. Freeing the authorities from the constraints imposed by state ownership will help them to carry out with vigour and imagination."[234]

This White Paper[235] was followed by a Bill published in November 1988, which was introduced into Parliament and finally was passed as the Water Act of 1989.

In 1989 the ten English and Welsh regional Water authorities[236], which had been established in 1973[237], were transformed from nationally owned and operated organisations, into privately owned public limited companies.[238]

The Water Act[239] is one of most elaborate and lengthy Acts to have ever been passed by Parliament with just under two hundred sections and twenty seven schedules. The Act's voluminous detail reflected its importance. The

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[234] HMSO, "*Privatisation of the Water Authorities in England and Wales*" (1986a), White Paper, Cmnd 9734, HMSO, London, para 38
[235] A document proposed by the government before a bill stating its intentions to legislate.
[236] The ten authorities were divided geographically and were named: Anglia, Northumbria, North West, Severn Trent, Southern, South West, Thames, Wessex, Yorkshire and Welsh Water.
[237] The ten regional water authorities were established under the Water Act of 1973.
[238] Appendix 7 lists the various Water Only and Water and Sewage Companies and their ownership. Appendix 8 lists the company web pages if more specific company information is required.
[239] The Water Act 1989: (http://www.legislation.gov.uk/ukpga/1989/15/contents)

British Government's decision to have a full divestiture of water and sewage assets from public to private, was not just an economic transfer but, a political decision that would have permanent ramifications; politically, financially, socially and environmentally far beyond the change of a utility system.

One of the primary concerns for the transfer from public to private related to the loss of holistic targets and an over-emphasis on one goal, the financial goal to minimise cost and maximise profit. Privatisation was driven by many factors including the belief that the private sector could increase the financial profits of the utility providers. The concern in this belief was that an increase in the propensity for these new corporate monopolies to focus on profit maximisation would benefit the financial area of the industry and potentially damage other areas. If the state owned enterprises lack of financial efficiency was to be explained by the fact that it was pursuing multiple goals then would the other areas suffer due to the movement towards financial profit? [240] The Government in order to control these corporate monopolies had to enforce stronger governance through new and direct legislation.

[240] Caves, Richard, "*Lessons from Privatisation in Britain*" Journal of Economic Behaviour and Organisation 13 (1990) 145-169, North Holland.

Privatisation and the Increase in Governance and Legislation

"*The real impact of privatisation has been not to withdraw the state from economic activity, but to change its role from a producer to the protective state. It is based on the principle that it is not the legitimate function of the state to be involved in economic production.*" Cento Veljanovski[241]

It initially appears paradoxical to envisage a conservative regime promoting the free market and also extending state regulation over the market, but that is what occurred. Indeed it was necessary. The institutional change needed a new method of controlling the new market and this was done through the adoption of new legislation and the construction of new regulatory bodies. Privatisation cannot simply be seen as an exchange of property, but it has to be considered holistically and in the case of privatisation in Britain and in the English and Welsh water industries it is intrinsically accompanied with regulation.

The primary measure of the regulatory bodies constructed is to safeguard a variety of interests.

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[241] Veljanovski, Cento, "*Privatisation in Britain – The Institutional Constitutional Issues.*" Marquette Law Review, Vol. 71:558, 1988

Three regulatory agencies were established: The Office of Water Services (OFWAT), The Drinking Water Inspectorate (DWI), and the Environmental Agency (EA). These are all encompassed in the Department for the Environment Food and Rural Affairs (DEFRA).

Resistance

Water was one of the last major privatisations enacted by the Thatcher administration and each previous privatisation was met with public sector resistance in the form of hostile Union action. The main fear of the Unions was that with privatisation would come job losses and indeed they later did.

The Union campaign was structured, organised and operated under steering group which was organised through the 'Water Joint Trade Unions Industry Committee' which was composed of representatives from industry's main Unions including; National and Local Government Officers Association (NALGO), GMB which is a general trade union, The National Union of Public Employees (NUPE) and the Transport and General Workers Union (TGWU). The Unions relied heavily on a public relations driven action

which involved a variety of actions to engage the public including demonstrations and the production and distribution of information leaflets stating the benefits of public ownership and the possible dangers of private ownership including an increase in pollution and an inability for private sector to adequately maintain and monitor satisfactory health standards, which indeed was the initial reason behind public ownership[242].

Although the Union fronted campaign against privatisation was a valiant attempt to prevent privatisation the government had too much to gain. The public sector borrowing would decrease, their assets which were rapidly deteriorating would no longer be a growing concern, the cost of maintenance and the burden of provision would be shifted from private to public and it would give the government an opportunity to liberate another utility into the free market which would in turn make a potential profit for citizens of Britain, the corporations who purchased the utilities and in turn the government through revenue not only from the sale but residual revenue from the profits of the sale. This was also (although arguably the most legally and politically complicated), another utility in a long list of utilities

[242] Ogden, Stuart "*The Trade Union Campaign Against Water Privatisation*" Vol 22, Issue 1, (20-35) 2001

to be privatised into an economy, which was experiencing an economic period of exceptional growth.

The Unions did add to the growing unpopularity of water privatisation, which was in due course countered by the government in a massive advertising campaign and the option (which as is later discussed was widely redeemed) to purchased shares which in turn almost instantly rose in value.

Although the Conservatives were victorious in the 1979, 1983 and 1987 elections privatisation was not always popular. The Conservative manifesto published before the 1987 elections clearly stated that if re-elected the Conservative administration would privatise the water (and electricity) industries. Although the Conservatives achieved a strong victory with a majority of over 100 seats the privatisation of the water industry was not popular. An opinion poll, which was conducted by MORI,[243] reported that in 1988, seventy five percent of people were against water privatisation.[244]

[243] Market research opinion poll (Market and Opinion Research International).
[244] MORI "*1988: Prospects for the New Year*" British Public Opinion, 10 (1988, January-February).

Privatisation was not by any means industry driven nor was it driven by the executives of the companies, indeed within the industry opinion was polarised. Mr Roy Watts the then Chairman of Thames Water publicly stated that he wanted the authority privatised. The then Chairman of North West Water was against privatisation as was Welsh Water authority and many others were less vocal about their preferred stance. This vocal expression of a somewhat distant concept stemmed from the fact that the Treasury in a bid to reduce borrowing were forcing the water authorities to dramatically increase their charges, Thames for example moved from a 3% increase to 10%[245]. The popularity of privatisation was increased by a variety of reasons. One conspicuous and calculable area, which directly correlated to the increase in popularity was the increase in share ownership.

The Sale

In 1979 only 7% of the population held shares a decade later this rose dramatically to 25%[246]

[245] Ogden S "*The Trade Union Campaign Against Water Privatisation*" Industrial Relations Journal, Vol 22 Issue 1 p 20

[246]http://www.instituteforgovernment.org.uk/sites/default/files/british_telecom_privatisation.pdf

Before privatisation the water industry in England and Wales comprised of ten regional water authorities and twenty nine privately owned water supply companies.

These ten regional water authorities were constructed in 1973. This centralised what had previously been 29 River Authorities, 1393 sewage disposal authorities and 157 water undertakings. By the time that privatisation was initiated the water authorities varied considerably in size, Thames Water was the largest authority with a turnover (in 1989) of £558 million and a workforce of 8,977 and South West Water was the smallest with a turnover (in 1989) of £106.3 million and a workforce of 1,876.[247]

Privatisation was initiated by the conversion of the ten regional water authorities and all other water and sewerage services into public limited companies, which were owned completely by holding companies.[248]

[247] Ogden, S, "*Transforming Frameworks of Accountability: The Case of Water Privatisation*" Accounting Organisations and Society, Vol 20 No 2/3 p 193-218, 1995
[248] Van Den Berg, Caroline, "*Water Privatisation and Regulation in England and Wales*" Public Policy for the Private Sector, The World Bank Group, Note Number 115, May 1997

The shares of these holding companies were sold initially by a public offering and then on the London Stock Exchange.[249]

Large financial investment was needed and privatisation was conducted in such a way that a public flotation would be a success. In order to ensure its success the government wrote off £4.95 Billion worth of debt.[250] Due to this the government's costs exceeded its revenues and the effect was that the government was left with a (sale) deficit of £1.3 Billion.[251]

Importantly the government needed to accept this financial blow if the stocks were to be viable on the market. A company burdened with such massive debts and expected to inject considerable amounts into expensive assets and repairs (thus acquiring more debt) would have been considered over geared and a poor investment. If share options were to be encouraged economics necessitated this government deficit to be written off.

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[249] Insert footnote – if not use approaches to – the world bank toolkit book
[250] Parker, David and Saal David, "*The Impact of Privatisation and Regulation on the Water and Sewerage Industry in England and Wales: A Translog Cost Function Model.*" Managerial and Decision Economics, Volume 21, No 6 (Sep, 2000) p253-268
[251] Van Den Berg, Caroline, "*Water Privatisation and Regulation in England and Wales*" Public Policy for the Private Sector, The World Bank Group, Note Number 115, May 1997

Asset Value Problem

It is argued by some that the utilities were sold at below actual value, whether this was the case and if this was due to problems in the privatisation through market valuation is still under debate. [252]

When publicly run utilities are sold and transferred to the private sector they are commonly subject to what is termed as Undervaluation and Under-pricing. Under-pricing is defined as when the shareholders have paid less than the opening market value of the shares. Undervaluation occurs when the market value of the company, which transfers from public to private is less than the replacement costs of the assets which include equity (capital fixed and variable) and claimable debt. The value of the utility was determined by a method chosen by the regulator (Ofwat) which devised an asset valuation from the average share price over the first 200 trading days (since privatisation), this figure was incorporated with the value of corporate debt minus cash balances. [253]

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[252] For a discussion on the asset value problem see: Grout A, Jenkins A, Zalewska A, "*Privatisation of utilities and the asset value problem.*" European Economic Review 48 (2004) 927-941

[253] For a discussion on the asset value problem see: Grout A, Jenkins A, Zalewska A, "*Privatisation of utilities and the asset value problem.*" European Economic Review 48 (2004) 927-941

In relation to undervaluation several points should be noted: It is very difficult to value assets at a national level. The government wished to sell the assets in an expedient fashion, the assets were depreciating rapidly and the longer they were in national ownership and disrepair the more money they were losing. Although assets can individually be valued, what was being sold (and the extent of responsibility being transferred) had not been sold and transferred before and hence a comparison to previous sales could not be made.

In relation to under pricing four points should be noted: The sale of the utility was open to all and indeed a very large percentage of the population gained from the increase in their stock price. The purchase of stocks is always a gamble, no company is ever guaranteed to rise in value and past performance (of in this case other privatised utilities) does no guarantee an increase in the stock price of the water stocks. This was the largest complete privatisation of a water utility from public to private out-with the Soviet Block ever and there were undetermined factors and problems which made this purchase arguably the biggest gamble of the utility sales. Hindsight

makes the observer unnaturally confident, the stocks did rise at a rapid rate, but this was not a certainty.

Taxation Revenue

From 2001 to 20010/11 the total tax revenue from the ten English and Welsh Water and Sewage Providers (excluding independent water and sewage providers) was 2.214426 billion pounds sterling with deferred tax of 774.301 million in deferred taxation calculating to 2.988763 billion pounds paid in corporation tax alone.[254] The £1.3 billion sale deficit has more than been paid over the years from corporation tax, regardless of taxation from other areas including income tax and value added tax.

Share Ownership

Millions of people purchased water shares. On the first day of trading, the shares appreciated between thirty and sixty five percent. Those who acquired shares in the water companies became far more supportive of the privatisation. In 1989 only thirteen percent of share purchasers had approved

[254] This figure was calculated by the author in conjunction with Ofwat.

of the water privatisation (nationally only fifteen percent approved of privatisation), this had dramatically increased to fifty nine percent by 1991. The stock sale paid political dividends to the Conservative party as increasing financial dividends were paid to the new owners of the water industry and of the voting population one in twenty were now those owners. [255]

Privatisation was unpopular with each utility sale, however it was politically a very astute play. The Thatcher government had persuaded those who were in principal initially opposed to privatisation to purchase shares when they were released, which proved to be profitable. Financially the voters acquired an interest and this interest was greater than any political or moral opposition, which they may have previously held against privatisation. Essentially this not only prevented the industry from becoming re-nationalised (as Labour advocated) but it ensured that that possible threat enticed previous Labour supporters to switch their vote from Labour to Conservative.

[255] Saunders, Peter, "*Privatisation, Share Ownership and Voting*." British Journal of Political Science, Volume 25, Number 1 (January 1955) p131 - 137

"*The act and experience of share purchase thus significantly altered the views which people had about this privatisation. This change in attitudes, while not surprising, is nevertheless important, for it indicates that those who bought shares not only benefited objectively from privatisation, but also became much more supportive of it. Any threat to renationalise, therefore, would not only represent an attack on these people's pockets, but would also appear to them to be unreasonable and, therefore, something to be resisted in principal*." [256]

Since privatisation the water companies have been extremely profitable[257] and continue to rise in share price.[258] Indeed since 2004 (to 2012) the share prices of the public listed water companies rose between 36 and 196%.

[256] Saunders, Peter, "*Privatisation, Share Ownership and Voting*." British Journal of Political Science, Volume 25, Number 1 (January 1955) p131 - 137
[257] Appendix 11 States the Revenue and Profit for the remaining Publicly owned companies.
[258] Appendix 10 narrated the share increase in the Public Limited Water Companies between 2004 and 2012.

The Financial Success of Thatcherism

The British economic decline was reversed in the 1980s. For over a century Britain had been financially deteriorating and that deterioration was halted and reversed.

"*There was a distinct improvement in productivity performance in the 1980s which led to a reversal of relative economic decline. The productivity revival was based on a successful attack on the inefficient characteristic of post-war Britain which had previously been precluded by the pursuit of corporatist solutions to economic problems.*[259]"

"*The electoral success of the Thatcher Government has been chiefly due to its economic success between 1982 and 1988. Its policies appeared to pay off through a marked improvement in economic performance.*[260]"

By 1990 many previously nationally run (now private) companies were ranked in the top 20 list of Britain's most profitable (profits in terms of per

[259] Crafts, N "*Reversing Relative Economic Decline? The 1980s In Historical Perspective*" Oxford Review of Economic Policy 7, 3 (81-98)
[260] Gamble, A "*Privatisation, Thatcherism and the British State*" Journal of Law and Society, 16, 1989

employee) companies. This list included BAA, five individual water companies, British Steel and British Telecom.[261]

Privatisation occurred through political will and economic necessity. The massive injection needed to rehabilitate the water infrastructure was impossible through public funding and the private sale and provision was the answer to a very important question. Since the sale how that provision has been handled and to what degree of efficiency shall now be ascertained.

Water unlike other utilities cannot be defined only in pecuniary terms but must incorporate other factors including the quality and price of provision. Financially Thatcher's sale of the utility was an astute decision. Importantly the decision was made not just in terms of financial viability but it focused on the best form of provision, which was deemed to be private.

Before evaluating the private system in England and Wales it is important to study the only non private system of the Kingdom which is in Scotland.

[261] " *Britain's Top 20 Companies*" Management Today, May, 1991

Conclusion

Privatisation was not isolated to the water sector in Great Britain, it was part of a gradual process driven by the Conservative Government under Margaret Thatcher. Privatisation was not initially a priority for the Conservative government but through a combination of economic necessity and political belief the wave of privatisation gathered momentum with Thatcherism and the beliefs held under the political party which was re-elected for four successive terms, three of which with Margaret Thatcher as Prime Minister. The privatisation of water was one of the last major privatisations being preceded by Electricity, Gas, Steel and Telecommunications. The process was refined at each stage and by the time that the government proposed the privatisation of water the structural transfer and legislative process had to a degree been practiced with the previous transfers. Although there was some resistance to the transfer from public to private this passed with the introduction of share ownership and the privatisation has remained in England and Wales since the transfer.

Before there can be further analysis into the private systems it is important to discuss the only remaining public system in Great Britain which lies in Scotland.

Chapter 4

Scotland

Introduction

Scotland is the only country in Great Britain to have retained a system of public provision. This chapter details why public provision was retained. In addition it describes the system in Scotland including the public provider and the legislation and governance. The chapter incorporates sections of a first hand interviews with the Chief Executive of Scottish Water and the Business Development Executive of Business Stream.

The effective nature of the provision in Scotland will also be assessed in this chapter through the six key elements (performance indicators) of effective provision[262].

[262] Economic, Price, Access, Quality, Environment and Sustainability

The History of Public Provision Retention

"*For quite a long time after the English privatisation in 1989, Scots congratulated themselves on avoiding it. Its most obvious result was a hefty increase in the cost of water to the consumer. In the first four years of the ten new regional water companies, the worst put up their charges by 50 per cent. Was this not just another example of capitalist greed and Thatcherite callousness? In the course of time, it became clear the reasons were rather more complicated. For years, for decades, water had not got the investment it needed. England possessed a magnificent Victorian infrastructure for the delivery of water, but successive governments had never maintained it.*"[263]

Scotland is the only country within Great Britain which did not have its water privatised by the Thatcher Government.[264] There is not a legal

[263] "*Case for Privatising Scottish Water is Crystal Clear*" 2 April 2010 The Scotsman. http://www.scotsman.com/news/michael_fry_case_for_privatising_scottish_water_is_crystal_clear_1_797483

[264] Northern Ireland is not Part of Great Britain the Island, but is part of the United Kingdom and does not feature in this Thesis . It should be noted that on 1 April 2007 responsibility for water and sewage transferred from local authority provision to provision by a government Owned company called Northern Ireland Water. For more information on the legislation enacting the provisions of Northern Ireland Water see the Statutory Instrument entitled, " Water and Sewerage Services (Northern Ireland) Order 2006 :

impediment to explain this exception, the factors which prevented privatisation were wholly political. Scotland during the Thatcher years was generally opposed to Conservatism[265], Thatcherism and as the Scotsman article highlights (above) the possible price costs of privatisation.
After the introduction of what was known as the 'Poll Tax' an already unpopular government avoided the implementation of water privatisation in Scotland, which was already an unpopular concept. [266]

"*The two principal drivers* [of privatisation]*; one was the Thatcherite view philosophically and two, the pragmatic view that a huge wave of investment was needed. This was the principal driver, attract investment from the equity and debt markets. There was an ideological drive but the big driver was the need to get capital investment*."[267]

(http://www.legislation.gov.uk/nisi/2006/3336/pdfs/uksi_20063336_en.pdf)
[265] Conservatism from a British and European not American perspective as in America the term is used to refer to different political concepts. British Conservatism is focused more on concepts of the free market and privatisation and not social or religious ideology.
[266] Butler and Adonis, "Failure in British government: The politics of the poll tax." Oxford University Press 1994
[267] Interview with Richard Ackroyd, Chief Executive of Scottish Water. See Appendix 1

The Unpopularity of Thatcherism and Privatisation

"*The privatisation of Scotland's water service is a taboo subject among many figures in the Scottish polity. Any development whereby ministers attempt a move that even Margaret Thatcher shied away from is likely to cause a major political row.*"[268]

The unpopularity of the Thatcher government grew steadily throughout Scotland as did the unpopularity of her political decisions and economic practices. "*Although her first visit to Scotland as Conservative Leader was a success, Maggie's relationship with the Scots quickly turned sour: she U-turned on Scottish devolution and during the early years of her premiership Scotland found itself being the brunt of a global recession. Industrial decline was followed by the striking miners and teachers then the loss of ten Scottish MPs*[269] *at the 1987 general election. Despite an attempt to regain lost*

[268] The Herald 'Storm Brews as privatisation touted for water provider". Sunday 24 January 2010:
http://www.heraldscotland.com/business/markets-economy/storm-brews-as-privatisation-touted-for-water-provider-1.1000992
[269] Members of Parliament

ground, Mrs Thatcher was snubbed by the Church of Scotland following her infamous 'Sermon on the Mound[270]*' and accused of 'testing' the controversial poll tax on hostile Scottish guinea pigs*."[271] It is the case that two decades since Thatcher the Conservatives have still not regained their lost ground, one of the prime reasons was what is called the Poll tax.

The Poll Tax

The 'Poll Tax' was an individual tax, which was not layered on ability to pay, but was levied at a flat rate. The Tax was officially called the Community Charge but was re-branded by the people and the media as the 'Poll Tax' due to its similarity to a tax introduced in 1381, which was so disliked that it caused a revolt. Indeed the effects of the poll tax were ironically to induce and produce a revolt.[272] Such was the outrage and unrest

[270] The Sermon on the Mound was the name given to an address made by Margaret Thatcher to the Church of Scotland in May 1988. The address offered religious justification for capitalism and a free market economy. St Paul was quoted among others 'If a man does not work he shall not eat." The full text can be viewed: (http://www.margaretthatcher.org/document/107246)

[271] Torrance, David, "We in Scotland, Thatcherism in a Cold Climate" Birlinn Limited, 2009

[272] Burns, Danny; " Poll Tax Rebellion" AK Press and Attack 1992

towards the Poll Tax that it produced the worst riots Britain had seen in a century[273].

Not only was this tax highly unpopular, but its unpopularity in Scotland was exacerbated by the fact that the tax was initially 'tested' in Scotland before other parts of the United Kingdom. The way in which the tax was constructed was unpopular in isolation, but this combined with the fact that the Scottish people felt as if they were being experimented on, made the poll tax political poison which turned the Conservative brand in Scotland so toxic that is has never truly recovered[274].

The Poll tax was so influential in Scotland that many (including Professor James Mitchell) believe it to be the catalyst galvanising support for

[273] BBC News – On this Day:
http://news.bbc.co.uk/onthisday/hi/dates/stories/march/31/newsid_2530000/2530763.stm
[274] Even at the last British election (2010), which brought a Conservative Prime Minister (although in coalition with the Liberal Democrats) the Conservatives only obtained one seat (there are seventy two seats) in Scotland and only collected 16.1% of the Scottish Vote. This was also shown in the Scottish Elections (Scottish Parliament) in 2011 where the Conservatives only obtained 12.4% of the vote.
UK Election (Scottish Results) :
http://news.bbc.co.uk/1/shared/election2010/results/region/7.stm
Scottish Election Results:
http://www.bbc.co.uk/news/special/election2011/overview/html/scotland.stm

devolution[275] and which was the prerequisite to the establishment of the Scottish Parliament.

"*The main legacy of the poll tax has been the Scottish Parliament. Opposition to the poll tax became aligned with the case for a parliament. The perception grew in Scotland that the Conservative government, with limited support north of the border, was imposing policies on Scotland - and the poll tax symbolised that better than anything else.*"[276]

The strong anti-governmental feeling combined with other strong beliefs concerning the proprietorship of water in Scotland made the mood in Scotland not only defensive towards privatisation but was seen as aggressive to the extent that it was labelled as 'ferocious' and the possible result 'incendiary'.

[275] A referendum on Scottish Devolution was held on 11 September 1997. A majority of almost 75% consented that there should be a Scottish Parliament. For more information on the implications of devolution see: (http://news.bbc.co.uk/1/hi/special_report/for_christmas/_new_year/devolution/42043.stm)

[276] BBC News, "*The Poll Tax in Scotland 20 Years On*"1 April, 2009 : http://news.bbc.co.uk/1/hi/scotland/7976782.stm

"*Water privatisation did not take place in Scotland, where opposition to the policy was ferocious"*[277]

"Privatisation south of the border happened thanks to Margaret Thatcher in 1989, but it was considered too incendiary to risk in Scotland at a time when passions were already running high about the poll tax"[278]

Thatcherism and privatisation were seen by most individuals, including the Scottish electorate, as intrinsically bound to one another. As Thatcher's government was the advocate of that privatisation, supporting one was seen as supporting the other.

"*Scotland was a more socialist country at that point. Political factors were more important against privatisation. This was shown in the Strathclyde*

[277] Utility Week, " Is it time to Privatise Scottish Water and Northern Ireland Water?" Feb 2011:
http://www.utilityweek.co.uk/news/news_story.asp?id=195026&title=Is+it+time+to+privatise+Scottish+Water+and+Northern+Ireland+Water%3F
[278] "*Salmond's Secret Talks on Scottish Water Sell-Off*" The Herald, 28 February 2010: (http://www.heraldscotland.com/mobile/business/corporate-sme/salmond-s-secret-talks-on-scottish-water-sell-off-1.1009804)

referendum[279]*. So privatisation did not happen and since then devolution happened and it has become a devolved responsibility*."[280]

The water of Scotland, its public ownership and devolved governance is all regulated by a combination of Scottish, British and European Legislation. This legislation is tailored to provide Scotland as a devolved nation with the power to control its own resource within the parameters of British and European legislation.

Legislation

The Scotland Act[281] established and provided authority for a devolved Scottish Parliament with devolved power and jurisdiction over certain matters including the provision of water and sewage[282].

The obligations of Scottish Water were defined by The Water Scotland Act 1980,[283]which ensured for example that " *Every Water Authority shall*

[279] The Strathclyde referendum is described and discussed lated in the chapter under the heading 'Unpopularity Remains'
[280] Interview with Richard Ackroyd, Chief Executive of Scottish Water. See Appendix 1
[281] The Scotland Act 1998: http://www.legislation.gov.uk/ukpga/1998/46/contents
[282] The legislation governing England and Wales and their regulators will be discussed later in the text.

provide in their mains and communication pipes a supply of wholesome water sufficient for domestic purposes of all owners and occupiers of premises within their limits of supply who are entitled to a supply for those purposes."[284]

The passing of the Scotland Act enabled the passing of power and legal responsibility from the Government and Westminster parliament in London (Westminster) to the Scottish Executive and the Scottish Parliament in Edinburgh. Since then there have been several Acts which have been passed by the Scottish Parliament which are related to water, the most important include; The Water Industry Scotland Act 2002[285], The Water Environment and Water Services (Scotland) Act 2003[286] and The Water Services Scotland Act 2005[287].[288]

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[283] The Water Scotland Act 1980:
(http://www.legislation.gov.uk/ukpga/1980/45/pdfs/ukpga_19800045_en.pdf)
Also the Sewage Scotland Act 1968, (as amended):
(http://www.legislation.gov.uk/ukpga/1968/47/pdfs/ukpga_19680047_en.pdf)
[284] The Water Scotland Act 1980 s 8.
[285] The Water Industry Scotland Act 2002:
(http://www.legislation.gov.uk/asp/2002/3/contents)
[286] The Water Environment and Water Services (Scotland) Act 2003:
(http://www.legislation.gov.uk/asp/2003/3/contents)
[287] The Water Services Scotland Act 2005:
(http://www.legislation.gov.uk/asp/2005/3/contents)
[288] The focus of the Thesis is utility provision and its surrounding legislation, the ante ceding chapter however discusses the legislation on the development of Scots riparian legislation.

Water Industry Scotland Act 2002[289]

After Devolution clarity was needed. The 2002 Act provided the legal restructuring of a new regulatory framework which amongst other things stated in Statue that there was a transfer of functions[290], property[291] and staff[292] to Scottish Water. This Act established the Water Industry Commissioner (WICS) who is responsible to the Scottish Executive for the economic regulation of Scottish Water,[293] this power includes price setting both for domestic and non domestic customers.

It also established the Drinking Water Quality Regulator[294] and provided its requisite legal base for power including that of entry and inspection of supply establishments[295].

In addition to this Water Customer Consultation Panels were established, their function being to : "…*have the general function of representing the*

[289] Water Industry (Scotland) Act 2002: (http://www.legislation.gov.uk/asp/2002/3/pdfs/asp_20020003_en.pdf)
[290] Water Industry (Scotland) Act 2002, Section 21.
[291] Water Industry (Scotland) Act 2002, Section 22
[292] Water Industry (Scotland) Act 2002, Section 23
[293] Water Industry (Scotland) Act 2002, section 1
[294] Water Industry (Scotland) Act 2002, Section 7.
[295] Water Industry (Scotland) Act 2002, Section 9.

views and interests of the customers of Scottish Water in the Panel's area in relation to the provision of services by Scottish Water in the exercise of its core functions.

A Customer Panel must:

(a) publish reports on any matter it considers relevant to the interests of those customers in relation to such provision,

(b) make such recommendations as it considers appropriate to the Commissioner as to the promotion of the interests of those customers in relation to such provision, either generally or in relation to any specific matter."[296]

Water Environment and Water Services (Scotland) Act 2003[297]

The Environment Act of 1995[298] created the Scottish Environmental Protection Agency (SEPA)[299]. SEPA exercises similar powers to its English

[296] Water Industry (Scotland) Act 2002, Section 2
[297] Water Environment and Water Services (Scotland) Act 2003 (http://www.legislation.gov.uk/asp/2003/3/pdfs/asp_20030003_en.pdf)
[298] The Environment Act 1995: (http://www.legislation.gov.uk/ukpga/1995/25/contents)
[299] Environment Act 1995, Chapter 2, Section 20:

Equivalent (The Environment Agency - EA[300]) in the Water Environment and Water Services (Scotland) Act 2003. The 2003 Act was the Scottish Legislature aligning itself with the Water Framework Directive[301].

Water Services Scotland Act 2005[302]

This act was important for two cardinal reasons. Firstly it replaced the Water Industry Commissioner with the Water Industry Commissioner for Scotland (WICS). Secondly it divided the operation of domestic and retail functions (for both water and sewage) which allowed competition into the marketplace for non residential (business) customers bringing the first (and currently only) form of privatisation into the Scottish market.

Licence provision is seriously assessed by the Commission, who regards several factors before any licence is granted (to the providers):

[300] Such powers include monitoring Scotland's water with regard to pollution both potential and actual. In addition it covers areas such as flooding and the transport and disposal of radioactive waste. The EA will be discussed at length later in the text.
[301] The European Union Water Framework Directive – Integrated River Basin Management for Europe: (http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32000L0060:EN:NOT)
[302] Water Services (Scotland) Act 2005: (http://www.legislation.gov.uk/asp/2005/3/pdfs/asp_20050003_en.pdf)

"*The Commission may grant a water services licence or a sewerage services licence only if satisfied that the applicant has the ability to perform adequately the activities authorised by the licence.*

In assessing an applicant's ability so to perform those activities, the Commission is to have special regard to the following factors (in so far as relevant in relation to the performance of those activities)—

(a) knowledge, expertise and experience; and

(b) financial acumen and business viability, and such other matters as the Scottish Ministers may by order specify."[303]

Business Stream is currently the largest provider and is wholly owned by Scottish Water.[304]

European Legislation

EU Legislation is binding in Scotland and the United Kingdom. National legislation was composed to allow Scotland to govern its water, including for example allowing Scottish Local Authorities the right and responsibility

[303] Water Services (Scotland) Act 2005 Part 2 Section 7: (http://www.legislation.gov.uk/asp/2005/3/pdfs/asp_20050003_en.pdf)
[304] Discussed Below

to collect taxation for the payment of the provision of water services[305]. This however does not enable the Scottish Government to legislate or act in contradiction with European legislation. Both Regulations and Directives have what is termed 'direct effect'[306] with Member States, which makes the European Legislation binding on each and every Member State.[307] Through direct effect, if there is not sufficient to place Scotland within compliance of European laws then this must be enacted. As stated one of the purposes of the Water Environment and Water Services (Scotland) Act 2003 was to align Scottish Legislation with the European Water Framework Directive. In addition to the aforementioned, other British and European legislation has forced changes in the Scottish Water Legislation and has, to a very limited degree, brought privatisation.

"*International legislation also has affected the governance structures of Scottish Water. It is widely accepted that the opening up to competition of*

[305] The Water Services Charges (Billing and Collection) (Scotland) Order 2010 Section 2 states; "*Every local authority shall, as respects water supply and sewerage services provided in a relevant year by Scottish Water in the exercise of its core functions to dwellings within the area of the local authority, demand and recover the charges (other than charges in respect of a supply of water taken by meter) payable for those services under a charges scheme*.":
http://www.legislation.gov.uk/ssi/2010/10/made
[306] Discussed in detail later in the Thesis .
[307] Kramer, Ludwig, "*The Implementation of Community Environmental Directives within Member States: Some Implications of the Direct Effect Doctrine."*Environmental Law Journal, Volume 3, No 1 (1991)

the non-domestic sector of Scottish Water's business was intended to protect Scottish Water as a public utility. The rationale being that it would fend off those who might use the Competition Act[308] *to open up the domestic sector to competition; or, in other words privatise Scottish Water. What was not mentioned at the time was the potential impact of other directives that originated from the EU: namely, the procurement and utility directives.*"[309]

The European Union's Utility Directive[310] was intended to facilitate competition by opening up markets and indeed the term 'Competition' is used in the Act 91 times. The Scottish Parliament in order to comply with this legislation enacted the Utilities Contracts (Scotland) Regulations

[308] The Competition Act 1998 as the name suggests encourages competition and legislates against the use of monopolistic business practices. The Act incorporates EU law as narrated in the treaties of Amsterdam and of Rome:
Competition Act: (http://www.legislation.gov.uk/ukpga/1998/41/contents)
Treaty of Amsterdam: (http://www.europarl.europa.eu/topics/treaty/pdf/amst-en.pdf)
Treaty of Rome:
(http://ec.europa.eu/economy_finance/emu_history/documents/treaties/rometreaty2.pdf)

[309] Cooper et al, " Scottish Water, The drift to privatisation and how democratisation could improve efficiency and lower costs." Public Interest Research Network, October 2006:
(http://www.stuc.org.uk/files/e-brief%20nov%202006/Waterreportfinal.pdf)

[310] The European Union's Utility Directive 2004/17/EC:
(http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32004L0017:en:HTML)
Also:
(http://www.mod.uk/NR/rdonlyres/87C64186-75F0-437B-85DB-5F16B34569D5/0/Utilties_Directive.pdf)

2006.[311] The EU clearly advocates competition within procurement and previous to the de-nationalisation of the business sector in Scotland any competition was impossible as there was only one provider. In addition to this British legislation itself left Scottish Water in a situation where its monopolistic nature could potentially leave it open for a legal action, the result was that the non domestic portion of provision was de-nationalised to the extent that other providers were now able to enter the marketplace.

The aforementioned legislation created the structure, which now governs the industry in Scotland. New organisations were created, arguably most importantly, the non domestic market now has multiple private providers[312].

Legislative Support

The legislation in general is supported by Scottish Water as being '*satisfactory*'. This is not to state that the organisation does not propose

[311] Utilities Contracts (Scotland) Regulations 2006: (http://www.legislation.gov.uk/ssi/2006/2/pdfs/ssi_20060002_en.pdf)
[312] Scotland on Tap (Government Web Page) – information on changing providers: http://www.scotlandontap.gov.uk/view_change_water_supplier_in_scotland.aspx

change in the parameters within which it can operate (which it does), but the process or regulation is considered fit for purpose.[313]

Business Stream (On Legislation)

From a commercial standpoint the legislation governing the industry is generally approved. It has been voiced that there are areas where they believe the legislation could be improved upon but it is recognised that it is a constantly evolving process and that evolution recognises their views:

"*In terms of legislation and regulation there are some very specific areas where we find difficulties in recovering our costs from some customers who choose not to pay. What I would say is that on the whole where a regulatory reason causes issues there are opportunities to influence or change this.*

We have a market 'technical panel' where participants can suggest changes, which are discussed and voted on. This is not always fruitful but is an option. Where legislative issues cause us pain there is no clear or easy way

[313] Interview with Richard Ackroyd, Chief Executive of Scottish Water. See Appendix 1

to address this. As you probably know changing legal statute takes some time and is often not realistic. In that sense it is important that the rules of the game take cognisance of legal weaknesses. This means that regulators and their agents need to listen to the concerns of market participants."[314]

Scottish Water

"*The way I sum it up is that it was a coming together of underperforming (Scottish) water authorities, into one, Scottish Water. It was created in the mid 90s, water previously being run by the regional (governmental) councils, which were abolished in the mid 90s. Over that period it has shifted, clearly now performing as well as with the providers in England and Wales, it having come from a long, long way behind. Every measure has improved from efficiency to the environment. If you go back, water was provided by the Scottish councils. In England and Wales there were already water provision entities.*"[315] This information provided by the Chief Executive of Scottish water is later analysed by studying the key elements of effective provision. As will be shown later in the text there have been many improvements including environmental improvements.

[314] Interview with James Bream, Business Stream, See Appendix 1
[315] Interview with Richard Ackroyd, Chief Executive of Scottish Water. See Appendix 1

Scottish Water provides (per year) over1.3 billion litres of water to over 5 million people in 2.4 million households. It operates and maintains over 47,000 km of water pipes and 297 water treatment works. In addition to the water provision, the sewage disposal system is also operated by Scottish Water. It operates and maintains 50,000 kilometres of sewer pipes, 1,837 waste water treatment works and 1,206 septic tanks. [316]

Scottish Water charges each individual a flat rate of (on average) £324 per year for water provision and related services including sewerage services[317] this has been frozen from prices of 2011 and has been publicised by Scottish Water as an aid to help individuals through the recession.[318]

The average household water (and sewage) bill in England for 2011 was £339[319]. It should be noted that there is a large disparity in England between the prices of average bills ranging (2010 -11) from £232 Thames Water to

[316] Scottish Water: http://www.scottishwater.co.uk/about-us/freedom-of-information/key-facts
[317] Scottish Water: (http://www.scottishwater.co.uk/you-and-your-home/your-charges/2011-2012-charges)
[318] Daily Record (http://www.dailyrecord.co.uk/news/scottish-news/2010/01/05/water-bills-in-scotland-to-be-frozen-next-year-86908-21944659/)
[319] Prices from the year 2010-11.

£570 South West Water.[320] This price disparity is approved by Ofwat and the variance is reasoned and rationalised due to the difference in capital spending, the difference in process cost and levels of rainfall.

The £324 is admirably competitive for a public provider. In addition to this Scottish Water continues to inject large amounts of capital into the continued improvement of the water infrastructure (and provision) with £443 million of investment in 2010-11. This continued investment can be shown by the fact that leakage levels have continued to reduce, indeed in 2010-11 levels reduced on average by 39 million litres of water per day which is 37% lower than when targets were first set in 2006[321]

Most importantly the quality of the water continues to increase as stated by Richard Ackroyd the Chief Executive of Scottish Water:

"*During 2010 we conducted more than 320,000 laboratory analysis tests on regulatory samples taken at water treatment works, service reservoirs and*

[320] Ofwat: http://www.Ofwat.gov.uk/consumerissues/chargesbills/prs_inf_charges2010-11.pdf
[321] Scottish Water Performance Summary 2010-11: http://www.scottishwater.co.uk/assets/about%20us/files/annualreportperformancesummary201011.pdf

customer taps. Of these 99.86% complied with the stringent regulatory standards. This represents a continuing improvement." [322]

Indeed not only has Scottish Water improved in the eyes of the Regulator but it compares well to the provision in England.

Scottish / English Comparison

Overall Performance Assessment (OPA) scores comparing Scotland and England show that Scotland gathered 291 points which was around the median mark of the English Water Authorities' 318 (highest) and 257 (Lowest).[323] The OPA is scored from a variety of measures which have the most influence on the end consumer. There include; drinking water quality,

[322] Scottish Water Annual Report 2010-11: http://www.scottishwater.co.uk/assets/about%20us/files/scottishwaterannualreportaccounts201011.pdf

[323] http://www.watercommission.co.uk/UserFiles/Documents/WICSPerformanceReport2010.pdf

leakage reduction, water pressure and interruption to water supply. Over the past five years Scottish Water has exceeded regulatory targets for OPA[324].

Importantly, It should be remembered that whereas the companies in England are private tax paying companies, with no subsidies, Scottish Water is provided with £140[325] – 150 Million per year.[326] It should be noted that this subsidy is not a grant but a 'loan': "*What it actually is, is not a subsidy but a loan in which interest is paid. The budget is 90% from customer revenue the remaining 10% is a loan in the form of the Scottish Government. The interest is being paid on that, it is important that it is a loan. In the eyes of the Scottish Government it is shown as government expenditure, interest is paid and they are re-financed*."[327] Essentially the company although performing admirably is still subsidised. In addition it should be noted that it does pay all forms of tax including corporation tax, value added tax and

[324] Scottish Water Annual Report and Accounts http://www.scottishwater.co.uk/assets/about%20us/files/scottishwaterannualreportaccounts201011.pdf

[325] Scottish Water funding was cut by the Scottish Government by £50 Million over the next 5 years (£10 per year from £150 - £140) It should be noted that Richard Ackroyd has stated that this cut was mutually agreed upon

[326] The Herald 'Storm Brews as privatisation touted for water provider". Sunday 24 January 2010: http://www.heraldscotland.com/business/markets-economy/storm-brews-as-privatisation-touted-for-water-provider-1.1000992

[327] Interview with Richard Ackroyd, Chief Executive of Scottish Water. See Appendix 1

national insurance, however due to the tax offset from the capital intensive programmes the offset (tax liability) is not great.

Secret of Success

"The core principal is that Scottish Water is a business not a public authority. We try to replicate the private companies, this is very important to out philosophy and methodology."[328]One of the key components in relation to the success of Scottish Water is in the philosophy and structure of the management of the organisation. It has been run and is driven by a management team who believe in the positive pressure of a business environment. By making the company efficiently run and lean, like a private organisation it has managed to deliver massive improvements in leakage, quality and price.

There were obvious deficiencies in the organisation being run like a 'public organisation'. The move towards a private practice, by those who approve of privatisation in England and Wales and previously worked in the private sector highlights not only the fact that water privatisation is admired but that

[328] Interview with Richard Ackroyd, Scottish Water, See Appendix 1

it is used as a successful model and its practices are mirrored. Financially without the annual government loan this organisation if it were a company would not be able to sustain its provision or operation.

Scottish Water Organisational Structure

The Scottish Water Industry is regulated and monitored by four main bodies. The Water Industry Commission for Scotland is the economic regulator of the water industry in Scotland and it approves the levels of financial charge on the end user.[329]

Consumer Focus Scotland represents the views and interests of the customers of Scottish Water. This is where for example complaints are directed and processed.[330]

The Drinking Water Quality Regulator is the body which regulates and monitors the quality of the water that Scottish Water supplies to customers.[331]

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[329] Water Industry Commission for Scotland: (http://www.watercommission.co.uk/)
[330] Consumer Focus Scotland: (http://www.consumerfocus.org.uk/scotland/)

The Scottish Environment Protection Agency is the agency in Scotland which monitors and regulates environmental issues such as waste discharge.[332]

The Regulator of Scottish Water

The Water Industry Commission for Scotland (WICS) is responsible for monitoring the price of water bills set by Scottish Water[333]. It is what is described in Britain as a QUANGO (Quasi Autonomous Non Governmental Body). It describes itself below:

"*We are a non-departmental public body with statutory responsibilities. Our mission is to manage an effective regulatory framework which encourages the Scottish water industry to provide a high-quality service and value for money to customers. We act independently of Ministers."*[334]

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[331] The Drinking Water Quality Regulator for Scotland: (http://www.dwqr.org.uk/)
[332] The Scottish Environment Protection Agency: (http://www.sepa.org.uk/)
[333] The counterpart of WICS in England and Wales being OFWAT.
[334] WICS : http://www.watercommission.co.uk/view_Our%20role%20and%20remit.aspx

WICS was established in 2005 and took over responsibility for economic regulation of water and sewerage services from the former Water Industry Commissioner for Scotland.

The establishment of the Commission and its powers are narrated in the Water Industry Scotland Act 2002 as amended by the Water Services etc (Scotland) Act 2005 Part I[335]. This legislation clearly states that the Commission has a statutory duty to promote the interests of customers[336]. It aims to ensure that customers get the very best value for money from their water and sewerage service. One of the ways it does this is by regulating prices for household customers and wholesale charges for suppliers to ensure that they represent value for money. What is perceived as good value is subjectively analysed by WICS. WICS also makes sure that Scottish Water develops infrastructure and improves the service provision by

[335] The Water Industry Scotland Act 2002, Part 1 (and continuing) (http://www.legislation.gov.uk/asp/2002/3/contents)

[336] *(1) There is established a body to be known as the Water Industry Commission for Scotland (referred to in this Act as "the Commission").*
(2) The Commission has the general function of promoting the interests of persons (taken as a whole) whose premises—
(a) are connected to the public water supply system or the public sewerage system (within the meaning of Part 2 of the Water Services etc. (Scotland) Act 2005 (asp 3)) or both, or
(b) might reasonably become connected to either or both of those systems,
relating to the provision to them of water and sewerage services.

monitoring its progress[337].

Since WICS was founded there have been several notable achievements including[338]:

Scottish Water has cut its running costs by 40% of its historic base, thus there has been a relative decline in household expenditure.[339] WICS has improved the transparency of Scottish Water's costs[340]. Leakage reduction has improved since the creation of WICS[341] and indeed in certain years leakage targets (set by WICS) have been exceeded by Scottish Water[342].

"*The Commission has successfully played this role within the overall system and is bringing clear benefits for customers. In 2009-10, average household*

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[337] WICS:
(http://www.watercommission.co.uk/view_Investment.aspx)
[338] Bolt Chris, "*Water Industry Commission for Scotland: Review of Performance and Strategy*." July 2010:
http://www.watercommission.co.uk/UserFiles/Documents/Combined%20-%20Commission%20review%20response%20document%20-%20final%20version.pdf
[339] WICS:
(http://www.watercommission.co.uk/view_Monitoring_Performance.aspx)
[340]WICS:
(http://www.watercommission.co.uk/view_Costs.aspx)
[341] WICS:
http://www.watercommission.co.uk/view_Leakage.aspx
[342] The Strategic Review of Charges (2010-15): Final Determination (WICS)(http://www.watercommission.co.uk/UserFiles/Documents/Final%20Determination%20document.pdf)

bills were the fourth lowest in the UK. SW is becoming more efficient and customer service is improving too. At the same time, there are record levels of investment to improve drinking water quality and environmental performance."[343]

Regardless of its other functions WICS is chiefly known for its price setting powers.

"The basic purpose is the same, they are there to regulate prices, they are there to look out for customer interest and promote competition. When WICS was first established they followed Ofwat closely. Over the years it has diverged but remains relatively similar.

WICS has been looking to come up with things more appropriate in Scotland. Wics does not use the same incentive measures, the commonalities are very substantial however as they are using Ofwat data and Ofwat methodology. That has been a very effective tool, the success of regulatory

[343] Bolt Chris, "*Water Industry Commission for Scotland: Review of Performance and Strategy*." July 2010: http://www.watercommission.co.uk/UserFiles/Documents/Combined%20-%20Commission%20review%20response%20document%20-%20final%20version.pdf

systems depends on the people who populate the system and it has on the whole worked.

The relationship in England (with Ofwat) went from hostile to collaboration and now to hostility, the same is true in Scotland. WICS was challenging and hostile and it has matured through that, so the regulator has more confidence and trust in Scottish Water."[344]

Setting Prices

WICS have a statutory duty to promote the interests of customers and this is principally done by setting prices for water and sewerage services that deliver Government Ministers' objectives for the water industry at the lowest reasonable overall cost. This price setting process takes place every five years.[345]

The price review for the next five year period has recently been published in WICS 'Final Determination'. Which has limited the rise in charges to

[344] Interview with Richard Ackroyd, Chief Executive of Scottish Water. See Appendix 1
[345] WICS : http://www.watercommission.co.uk/view_Our%20role%20and%20remit.aspx

customers to a rise of 5% below the rate of inflation (based on the RPI[346]). In the initial year 2010 – 11 there was a price freeze and from 2011-15 prices for household unmeasured wastewater have been capped at RPI minus 8.1% for household (unmeasured[347]) water and at RPI minus 2.1% for household (unmeasured) waste water which averages at RPI minus 5%. [348]

The Non-Domestic sector follow the same restrictions as the caps set for households. Due to there now being competition in the business sector individuals may be able to be provided prices below those costs provided by Business Stream which is the private arm of Scottish Water.

"*The principles of pricing are set by the Scottish Government. For example, one of the broad principles is to have stable prices. I alluded to 'default tariffs'. Each year all licensed providers are set a maximum price and a minimum service that they can provide. This provides a safety barrier for customers. We use this as our minimum offering. We offer all customers a*

[346] Retail Price Index
[347] Metering shall be tested during this period but as yet has not been introduced.
[348] WICS, "*The Strategic Review of Charges 2010-15*" : The Final Determination http://www.watercommission.co.uk/UserFiles/Documents/Final%20Determination%20document.pdf

better service at a lower price than the default levels. It is of course partly the choice of the customer what they want to take!"[349]

There is a right of appeal, which Scottish Water can use if they feel that the price set by WICS is unreasonable. Scottish Water can require WICS to refer this determination to the Competition Commission within 60 days of the publication of the price caps. (The Competition Commission is an non governmental independent body which has legal authority to ensure fair commercial competition and in addition it has specific functions, such as the analysis of pricing disputes, within major regulated industries which include water.)[350] The Competition Commission would then have to decide whether the lowest reasonable overall cost of delivering the Scottish Government's objectives is equal to, higher or lower than the prices set. The Competition Commission would take into account the same issues that WICS considers. The Competition Commission's conclusions would be binding, subject to judicial review by the Courts.[351] The same redress is also possible for businesses who believe the prices have been unfairly determined.

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[349] Interview with James Bream, Business Manager of Business Stream, See Appendix 1
[350] The Competition Commission:
(http://www.competition-commission.org.uk/about-us)
[351]WICS, "*The Strategic Review of Charges 2010-15*" : The Final Determination
http://www.watercommission.co.uk/UserFiles/Documents/Final%20Determination%20document.pdf

The Household Charge

In England domestic charges are calculated either by a flat rate tax or by a metered charge. In Scotland domestic customers are subject to a flat household charge. The household charge is based on the Council Tax.

Council Tax was introduced by the Labour Government in 1992 by the Local Government Finance Act of 1992.[352] This Act introduced as a successor to the unpopular Community Charge (Poll Tax) is levied across the UK[353]. The tax is levied per dwelling and the tax (attempts to be) proportionate to the dwelling. Dwellings are assessed individually by local assessors, thus dwellings are provided with a tax band, which ranges from A to H[354]. The bands range from houses of value from under £27,000 (Band A) to houses of £212,000 (Band H) and are assessed by the city assessor,

[352] The Local Government Finance Act 1992: (http://www.legislation.gov.uk/ukpga/1992/14/contents)
[353] The Scottish Government have however frozen council tax rates since 2007. See; Currie, B "*Council tax to be frozen until 2013 in New Deal*" The Herald, 28 December: (http://www.heraldscotland.com/politics/political-news/council-tax-to-be-frozen-till-2013-in-new-deal.1325048409)
[354] There are eight bands in Great Britain with the exception of Wales which has nine bands.

subject to discounts and exemption[355]. Each country within Great Britain has different tax amounts per band. The levy is collected at a local level.

The way in which household charges (water charges) are calculated and collected are directly linked to the Council Tax Band for individuals. Their water charge is linked to their Council Band. Therefore an individual in band A will pay far less than an individual in the highest band (Band H). The Charges for the year 2012-2013 will remain the same as the previous year's charges.

Table 4

Charges of Water and Waste Services by Scottish Water 2012-2013.[356]

COUNCIL TAX BAND	WATER SUPPLY	WASTE WATER COLLECTION	COMBINED SERVICES
A	£121.44	£140.94	£262.38
B	£141.68	£164.43	£306.11

[355] See Glasgow's Information page: (http://www.glasgow.gov.uk/en/Residents/YourHome/CouncilTax/Banding/)
[356] Information provided by Scottish Water

C	£161.92	£187.92	£349.84
D	£182.16	£211.41	£393.57
E	£222.64	£258.39	£481.03
F	£263.12	£305.37	£568.49
G	£303.60	£352.35	£655.95
H	£364.32	£422.82	£787.14

One can see from this that the cost of the service is not directly related to the consumption of the product, nor is it a flat fee from the corporation, but it is a variable rate on the Council Tax Band. Thus there may be a situation where a house, which consumes very little water is charged the same amount as a house which uses large amounts of water. An example may be a couple in an expensive house, who have low incomes and use little water may be charged much more than a very large family residing in a less expensive house who consume several times the amount of water consumed by the couple, but may pay up to £524.76 less per year for their water. A system which some find equitable and others quite the opposite.

It should be noted that the Scottish at source deduction is unlike the system in other parts of Great Britain where there is a separate water charge.

Report on the Performance of WICS

WICS Commissioned an independent report to review its performance, which was written by Christopher Bolt the respected economist and former Chair of the Office of Rail Regulation.[357] The report stated that the Commission had a challenging and difficult task because among other things Scottish Water is a wholly owned and governed governmental body which means that this one body is both responsible for the national water strategy in addition to being the sole shareholder and service provider.

The report did commend the Commission in its positive role in preventing an escalation in prices and by ensuring the provision of a service, which compared to England was one of the cheapest providers. In addition to this the quality of the water provided has continued to improve. The report was not however without criticism of the Commission and recently the press have also criticised WICS for frivolous and lavish spending*"*[358]

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[357] Bolt Chris, "*Water Industry Commission for Scotland: Review of Performance and Strategy*." July 2010: http://www.watercommission.co.uk/UserFiles/Documents/Combined%20-%20Commission%20review%20response%20document%20-%20final%20version.pdf

[358] "*The Quango led by chief executive Alan Sutherland and chaired by Sir Ian Byatt has suffered a barrage of negative publicity about its spending decisions. The public body*

There are five main criticisms highlighted in the report; Efficiency, Engagement, Environment, Diversity and Clarity. The criticisms are expanded and dissected below.

Efficiency

The Commission consults on individual policy areas and publishes an annual report accounts and corporate plan, however it has not constructed and published its overall strategy. This lack of general focus was highlighted in the report along with various other ways in which the Commission could become more efficient. One of the ways suggested to improve efficiency is by a clear structure and process for identification, monitoring and review.

"*The Commission should develop, after consultation, its regulatory strategy for key policy areas. It should identify the aims and expected outcomes, the*

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shelled out around £25,000 on an event at a five star spa respor in Hampshire, £14,000 on a staff away day at Hamilton Park racecourse and £3,400 on four dinners at the New Club in Edinburgh "*Report Highlights Leadership Failure at Water Watchdog*", Scotland on Sunday, 17 October 2010.

arrangements for monitoring those outcomes and the process for reviewing its strategy and modifying it if required."[359]

In addition to the report commenting on the possible improvement of WICS efficiency it also states that WICS should push for greater efficiency within Scottish Water.

"*Some stakeholders have suggested that the Commission has not pushed SW hard enough on efficiency…. There is a need for clearer incentives for SW to understand their costs, identify poor performance and inefficiencies, and find innovative approaches."*[360]

Engagement

One way in which the Commission was criticised was its engagement with stakeholders. certain stakeholders perceive that the Commission fails to take

[359] Bolt Chris, "*Water Industry Commission for Scotland: Review of Performance and Strategy*." July 2010: http://www.watercommission.co.uk/UserFiles/Documents/Combined%20-%20Commission%20review%20response%20document%20-%20final%20version.pdf
[360] Bolt Chris, "*Water Industry Commission for Scotland: Review of Performance and Strategy*." July 2010: http://www.watercommission.co.uk/UserFiles/Documents/Combined%20-%20Commission%20review%20response%20document%20-%20final%20version.pdf

customer consultation seriously. To improve the situation the report suggests an active engagement with all stakeholders, including customers, customer representative bodies, Government, and environmental and water quality agencies. This active participation would improve the understanding of the choices available (to WICS) and their impact on prices, levels of service and the environment.

"*Incentives that enable and encourage innovation, and deal with excessive cost and underperformance – this is key to delivering better outcomes for both customers and*

the environment."[361]

Environment

The WICS Report also highlighted that The Scottish Environment Protection Agency and the Drinking Water Quality Regulator for Scotland have been involved only formally and relatively late in the price capping process. Consulting these agencies on environmental issues, including helping in a

[361] Bolt Chris, "*Water Industry Commission for Scotland: Review of Performance and Strategy*." July 2010: http://www.watercommission.co.uk/UserFiles/Documents/Combined%20-%20Commission%20review%20response%20document%20-%20final%20version.pdf

move to a reduced level of leakage is important. These agencies should not simply be consulted but involved to gain as much knowledge as possible to set prices which are both affordable and environmentally sustainable.

Diversity

The report criticised the fact that WICS was comprised exclusively of white males. And stated; "*More could be done to ensure that Commission members are selected from the whole field of talent. They must of course continue to be selected on merit, against objective criteria to ensure members offer the requisite skills and expertise, however this should be done with due regard for the benefits of diversity*." This comment is therefore presuming that elements other than merit have been factors in the selection process, which is unfair on two accounts. Firstly positive discrimination in Britain is illegal and secondly most individuals in the water industry are male in Scotland. In addition 95.5% of all Scots are classified as white and therefore it is a very homogenous society.[362] If it could be proved that the

[362] Scotland's Consensus (2001) – Note a decade has passed and figures may have varied slightly since the last consensus but immigration is restricted for non EU Nationals. (http://www.scrol.gov.uk/scrol/warehouse/NewWards_ER_CA.jsp)

organisation was either sexist or racist then those charges should be taken seriously, this has however not occurred.

Clarity

WICS although successful in some areas, does seem to be almost conducted in a similar fashion to a traditional family business. This does not mean that what it produces is unsuccessful, but the way in which it does so produce lacks clarity of process and role definition.

Bolt states:

"*There does appear, however, to be some lack of clarity of the respective roles of the chairman, chief executive, for example in respect of internal and external relationships and in areas of responsibility, and of non-executives.*"

"*In a number of areas, there is scope to improve the consistency, formality and hence accountability of processes which the Commission uses*."

For every organisation clarity in process is paramount for transparency. This is particularly important for WICS as it is not only a regulator but it self regulates.

Improvements[363]

The Report not only criticises but offers recommendations on how WICS can improve . For example it recommends:

"A simpler, more transparent process, where customers and stakeholders are able to participate in decisions based on clear understanding about costs and benefits."

"Simpler mechanisms for agreeing expenditure and monitoring performance."

"Clear strategies for interactions with government and stakeholders."

[363] Bolt Chris, "*Water Industry Commission for Scotland: Review of Performance and Strategy*." July 2010: http://www.watercommission.co.uk/UserFiles/Documents/Combined%20-%20Commission%20review%20response%20document%20-%20final%20version.pdf

"Appraisals and performance management that are clear and consistent, used throughout the organisation and linked to review/ remuneration/ bonuses with clear criteria and SMART objectives."

"Publication of a medium-term strategy and business plan."

"Changes to the price setting process – so that the calculations are easier to understand and SW can plan for the longer term with greater confidence about the level of resources that will be available to it."

"Developing a robust system of economic cost capture – so that there is clarity and greater transparency about the costs of various activities that make up water and sewerage services."

The report in its criticism and suggested improvements focuses on the need for WICS to become more of a professional organisation with greater transparency, clarity, strategy and improve communication with stakeholders. Currently WICS is achieving many positive goals. It is however constricted from its full potential by its antiquated methods and its lack of modern and transparent decision making model.

It is important to however remember that WICS has been successful in relation to controlling price. As the Report states, since WICs was established average household bills are £105 lower than they would have been without regulation.

"*Household bills are now lower in real terms than they were eight years ago, and are set to reduce by a further 5% by 2015*".[364]

WICS like every body has flaws, but unlike every body it has been successful. To improve further it should incorporate the suggested improvements which have been highlighted in the Report.

Waterwatch and the Scottish Public Services Ombudsman.

Complaints relating to Scottish Water were dealt with by Waterwatch. Waterwatch was established as a consumer watchdog and was closed on 15

[364]http://www.watercommission.co.uk/UserFiles/Documents/WICSPerformanceReport2010.pdf

August 2011[365]. The public Services Reform Scotland Act[366] transferred the complaints handling function of Waterwatch Scotland to the Scottish Public Services Ombudsman (SPSO)[367] and the customer representation function of Waterwatch has also been transferred to an organisation called Consumer Focus Scotland. In 2012 Consumer Focus Scotland will be disbanded and the duties which it covered shall be covered by Citizens Advice Scotland.[368]

The bodies governing water in Scotland are described above. In the future there is a strong possibility that Scotland may privatise its water, although this has been and still is a very controversial issue.

Unpopularity Remains.

The concept of water privatisation during the Thatcher era was deeply unpopular, even more recently the Scottish anti privatisation stance was clearly shown when there was a referendum on the issue in 1994, which was

[365] http://www.waterwatchscotland.org/
[366] Public Services Reform (Scotland) Act 2010
[367] http://www.spso.org.uk/contact-us
[368] Consumer Focus Scotland:
(http://www.consumerfocus.org.uk/scotland/news/message-from-the-chair)

organised by Strathclyde Regional Council[369]. 71% of those who were eligible to vote cast their ballot which amounted to 1.2 million ballots (for the region of Strathclyde). The result was clear, 97% of those who voted rejected water privatisation. Opinion polls across Scotland also registered similar levels of disregard to the concept of privatising Scottish Water. [370]

It should be noted however that although 1994 is relatively recent politically a considerable amount in Scotland has changed. Importantly Scotland now has a devolved parliament and the Scottish Nationalists have the majority of that parliament. The SNP (Scottish National party) have been able to introduce proposals into their manifesto which would have previously been branded as Conservative such as the freeze on Council Tax[371] and the possible reduction in corporation tax once tax altering powers have been granted to the Scottish Government. " *Control over corporation tax would enable us to boost investment, bringing jobs to communities across Scotland,*

[369] Strathclyde was one of nine former local government regions in Scotland. Created by the Local Government (Scotland) Act 1973 and abolished in 1996 by the Local Government etc (Scotland) Act 1994. Strathclyde had the largest population of any region with over 2.5 million.
[370] Cooper et al, " Scottish Water, The drift to privatisation and how democratisation could improve efficiency and lower costs." Public Interest Research Network, October 2006:
(http://www.stuc.org.uk/files/e-brief%20nov%202006/Waterreportfinal.pdf)
[371] SNP Webpage:
(http://www.snp.org/vision/better-scotland)

grow the economy and take the right decisions for Scotland. There is clear evidence from around the world of the benefits of lowering burdens on business…"[372]

Privatisation is Considered

Privatisation is now being advocated by many leaders of the economic and political community. Many in the business sector have advocated the case of privatising Scottish Water.[373] Even Labour politicians are now (although some reluctantly) advocating privatisation as a solution. (Sam Galbraith[374]) "*We are…slowly going broke, and the only way to solve this is to reduce the public-sector wage bill. Privatise water and, at a stroke, the bill is cut.*"[375]

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[372] "*SNP Call For Devolution on Corporation Tax Powers*" The Daily Record, August 16, 2011: (http://www.dailyrecord.co.uk/news/politics-news/2011/08/16/snp-calls-for-devolution-of-corporation-tax-86908-23349399/)

[373] Including Financier Frank Malcolm of Stockbrockers Bell Laurie White: 7 May 2006, "Fresh Call for Scottish Water to be Privatised" 7 May 2006The Scotsman: http://www.scotsman.com/business/energy-and-utilities/fresh_call_for_scottish_water_to_be_privatised_1_1411720

[374] Sam Galbraith was a former member of the parliaments in Westminster and Scotland and represented the Labour Party. Although philosophically he did not want Scottish Water to Privatise economically he called on its privatisation as the only viable solution.

[375] "Benefits of Privatising Water" The Scotsman, 10 February, 2005: http://www.scotsman.com/news/benefits_of_privatising_water_1_674594

Indeed recently Gary Womersley, past Chief Executive of consumer watchdog Waterwatch Scotland, called on the government to consider selling off SW after cutting its funding by £50 Million over the coming five years[376].

In addition to the above aforementioned figures, Sir Ian Byatt (Chair of The Water Industry Commission for Scotland) announced a blueprint for the privatisation of Scottish Water, which caused outrage in the Scottish Water Industry to the extent that representatives called Ross Finnie MSP (The Environment Minister) to sack Sir Ian. [377] (The criticism being that the role of the WIC was and is not to comment on 'if or when' Scottish Water should be privatised.) If privatisation were to proceed the 3,400 employees of Scottish Water would obviously have an uncertain future, this is not to state that there would be job losses, simply with change comes uncertainty.

The SNP government although it has not publicly endorsed privatisation, indeed it has publicly rejected the idea[378], has consulted various private

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[376] "*Salmond's Secret Talks on Scottish Water Sell-Off*" The Herald, 28 February 2010: (http://www.heraldscotland.com/mobile/business/corporate-sme/salmond-s-secret-talks-on-scottish-water-sell-off-1.1009804)
[377] UNISON "*Water Privatisation and Regulation Briefing 140*" http://www.unison-scotland.org.uk/briefings/waterprivjune.html
[378] "*Government says Scottish Water to remain Public*" BBC News 1 August 2010:

organisations regarding a potential sale. Following an inquiry into the possible sale of Scottish Water (made possible by the Freedom of Information Act) it has been revealed that Alex Salmond and the Finance Secretary John Swinney have held secret meetings about the possible sale of Scottish Water to the Australian Banking Group Macquarie[379] as far back as 2008[380].

"The SNP has recently been embroiled in controversy over the future of Scottish Water. The Sunday Herald has reported that the Scottish Futures Trust is looking at alternative models for future ownership of Scottish Water and is considering whether it should be sold off. Although the SNP has insisted that privatisation is not an option, it is now clear that two of the country's most senior ministers were exploring a change in ownership in parallel to the review [of Scottish Water]. The Tories [Conservatives] and the LibDems [Liberal Democrats] have long called on the government to

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http://www.bbc.co.uk/news/uk-scotland-10829059

[379] An Australian multinational that currently owns Thames Water

[380] "Salmond's Secret Talks on Scottish Water Sell-Off" The Herald, 28 February 2010: (http://www.heraldscotland.com/mobile/business/corporate-sme/salmond-s-secret-talks-on-scottish-water-sell-off-1.1009804)

consider at least mutualising the utility which would save the £140 million a year that it currently lends to keep it functioning.[381]"

Currently there is no political admission that privatisation is an option, but quite clearly it has been discussed at length and is therefore by deduction an option worth considering.

Scottish Water is still a publicly governed, owned and operated utility covering a vast area of land and services including all domestic users ; city dwellers, country dwellers and those living in the islands off the coast of mainland Scotland.

[381] Salmond's Secret talks on Scottish Water sell-off The Herald on Sunday, 28 February, 2010:
http://www.heraldscotland.com/mobile/business/corporate-sme/salmond-s-secret-talks-on-scottish-water-sell-off-1.1009804

Scottish Water and Privatisation

(Interview with R Ackroyd Chief Executive)

Comments on England and Wales

"*In England and Wales this system on the whole and its regulation has been positive. Almost £100 Billion has now been invested, the environment has improved and quality is vastly better.*"[382] Later in the text the key elements of provision in both England and Wales shall be analysed to ascertain if there have been improvements.

When Mr Ackroyd was asked if Privatisation has on the whole been better for England and Wales his answer was a resounding '*Yes*'.

It was informative and honest that Mr Ackroyd was so positive and complimentary towards the private English system. The two areas he considered to be beneficial which were brought by privatisation were the ability to raise funds and the incentive to perform. Mr Ackroyd openly (in

[382] Interview with Richard Ackroyd, Chief Executive of Scottish Water. See Appendix 1

the interview) wanted Scottish Water to be allowed to raise money from private arenas including the debt market.

"*There are multiple models and privatisation can cover a variety of models. The English model is unique in that it is privatisation with companies being floated in the stock exchange. In the US most companies are not floated on the stock exchange. So there are a variety of models that you can have. The key element of the English system is that you have got private capital. You have private capital, which would otherwise not be available. Secondly the regulatory system has been absolutely vital, because what it is doing is imposing pressure, incentives and penalties for the sector. These are lacking naturally because it is a form of monopoly, the private pressures are not present, you can have a very well intentioned management, but even the best intentions can get fat and lazy. Equally you can have a self interested management. The regulatory management has been very important, it has to be underpinned by checks and balances, the legal function in essence. There is a statutory obligation of OFWAT. OWAT has a duty to finance their functions. The investors (of the providers) earn a reasonable rate of return in their investments this is a vital principle*."

Mr Ackroyd brought not only his knowledge from working in the English System to Scotland but his fervour for its success. The easy thing for Mr Ackroyd would be to say nothing in relation to the English system or indeed to criticise its weaknesses in favour of his current employer, the publicly held Scottish Water.

One of the areas however that Mr Ackroyd did highlight as being more advanced than the English system was the inter regional[383] competition that Scotland has in the non domestic market. (Indeed since the interview England has now opened up its non domestic market to competition as shall be discussed later.)

Non domestic customers now have the opportunity to obtain water from private providers; as has been discussed this division was created not only to increase competition and efficiency within the industry but also so that Scottish Legislation was aligned with both National and European legislation. The largest private provider is Business Stream which is a corporation owned by Scottish Water.

[383] (Non domestic competition will now be introduced in England and Wales as will be discussed later in the Thesis . From this aspect England and Wales followed the example of Scotland.)

Business Stream

Competition for business customers in Scotland was introduced on 1 April 2008, under the Water Services etc. (Scotland) Act 2005. Under the Water Services Act of 2005, Scottish Water was compelled to divide its operation into wholesale and retail units. The competitive market for water and waste services was opened up to businesses in 2008. In 2009, OFWAT granted Business Stream[384] which is Scotland's primary non domestic water service company and a wholly owned subsidiary of Scottish Water[385] a license to operate water and waste water services in England and Wales.

"*The competitive market has been in place in Scotland since 2008 and has put an end to the one size fits all model which still exists in England. We have put the focus on the customer developing more than 50 new services and helping them save over £5.5 million in water consumption over the past 12 months. The industry in England and Wales is poised for dramatic changes where the introduction of wider competition is firmly on the agenda. Having our license gives us the ability to influence the direction of*

[384] http://www.business-stream.co.uk/
[385] http://www.scottishwater.co.uk/

these changes for the benefit of the customer." Mark Powels, Chief Executive of Business Stream.[386]

The introduction of the competitive retail market has delivered increased innovation, improved customer satisfaction and better value for money for customers, with over 42% of customers now paying less than they would have under the default tariffs. Surplus before tax for Business Stream in the year was £23.1 million, an increase of £7.8 million or 51% from 2009/10. Gross profit increased by £13.6 million from 2009/10 on a turnover in the year of £358.2 million. Operating costs increased year-on-year by £6.3 million or 38% reflecting costs associated with growing the customer base and increased investment to improve data quality. Operating profit at £25.0 million was £7.3 million higher than in 2009/10. [387]

To date liberating the market and encouraging privatisation has increased revenue from business tariffs and increased business efficiency has reduced bills for the consumer.

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[386] Powels Mark, (Article drafted by Hamilton, Gouglas) The Herald Paper, "*Business Stream – OFWAT*", September, 25 2009

[387] Scottish Water Annual Report and Accounts http://www.scottishwater.co.uk/assets/about%20us/files/scottishwaterannualreportaccounts201011.pdf

"*In the first year that the water and sewerage market in Scotland was opened up to competition, over a third of businesses and public sector organisations were getting a better deal on their water bills or enjoying other benefits such as bespoke water saving advice, easier billing and new tariffs*."[388]

The Competitive Market

Total non domestic revenues are only £350m and Business Stream continues to dominate the market in terms of market share. It is however still a fresh concept with few competitors for Business Stream. As other utilities have privatised more and more competitors have emerged and this is bound to happen through time as other organisations observe the possible business opportunity. This would undoubtedly increase if the domestic sector were to be privatised.

[388] Bolt Chris, "*Water Industry Commission for Scotland: Review of Performance and Strategy*." July 2010: http://www.watercommission.co.uk/UserFiles/Documents/Combined%20-%20Commission%20review%20response%20document%20-%20final%20version.pdf

One other issue which needs to be resolved, is the lack of awareness of privatisation in the non domestic sector. As many individuals are not aware that there is competition in the market they are not taking advantage of possible price savings. *"In 2009 a survey of members of the Federation of Small Businesses Scotland found that 75% of members surveyed were not aware of that the market had opened up to competition"*[389] Awareness shall however increase with time.

The introduction of competition for the non-domestic market is the only direct way in which there is competition. The capital programmes used to transport the water operated by Scottish Water and other private non domestic providers is not publicly but privately operated. This exposes another area in which Scottish Water the public utility provider is completely dependent on the private sector.

The competition since its operational birth has been thus far a success as was show in the interview with its business director James Bream[390]:

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[389] Bolt Chris, "*Water Industry Commission for Scotland: Review of Performance and Strategy*." July 2010: http://www.watercommission.co.uk/UserFiles/Documents/Combined%20-%20Commission%20review%20response%20document%20-%20final%20version.pdf

[390] Interview with James Bream, Business Manager of Business Stream, See Appendix 1

"*In terms of the country what I can respond to is that it can generate a lot of benefits for customers, the market and the public in its widest sense. It is worth noting of course that we only have non-domestic competition at this time. Some of the benefits are as follows:*

Customer Savings

As at October 2010 over 40% of customers are receiving discounts from default charges. We expect to have 50% off default charges by April 2011. Default tariffs are the maximum retail charges which a licensed retail provider can charge. These maximum charges are what would have been charged if there was not a competitive market.

Customers have saved £10 million consumption costs through water efficiency projects.

Over 70% of public sector organisations now receive a single electronic bill (rather than paper bills) and over 15% of our total customer base has signed up for e-billing in the last 12 months, saving them time and money.

Increased Choice

Customers now have access to over 60 added value services, helping them to save time, save money, reduce risk and meet environmental targets.

Customers can now access innovative new propositions, including online benchmarking, smart metering and water efficiency services.

Access to capital investment for efficiency projects under risk reward financing models. This is particularly important as we go through some severe public sector cuts particularly capital budgets.

Environmental Benefits

We've saved customers over 5,000 tonnes of CO2, the equivalent of taking over 1,400 cars off the road.

We've issued businesses over 15,000 free water efficiency packs.

Better Service

Satisfaction has increased from 72% to 81%.

There are more very satisfied customers from 24% to 29%

Benefits to the Market

We have reduced our inherited cost base by 22% in just over 3 years.

In November 2006, Business Stream was allocated £90 Million of funding debt for set up. Through creating a customer centric brand we have been able to to repay a significant amount of this sum, reducing the total outstanding debt to £44.5 million.

We have driven the wholesaler, Scottish Water, to improve their performance by providing increased external challenge. This benefits the country as Scottish Water is publicly owned.

I also think that the competitive market reduces the regulatory burden. It is very valid to claim this benefit as markets can help send the right signals and don't have the same level of information asymmetry a regulator faces."

Indeed these registered and verified statistics[391] *show that Business Stream and the liberating of the market has made impressive improvements. This is not say that there are and shall continue to be areas which need to be improved. However market liberalisation has been shown to have the ability to succeed.*

The future is to possibly move further and liberalise the markets within the regions so that inter region competition (in England and Wales) is possible at a non domestic and possibly domestic level.

For many years we have been in catch up from the English system. I don't want to preach to other providers. We are however more advanced in the fact that we have retail competition for non household customers. This is not

[391] Many of which can be found on the Business Stream Webpage and Company documents and materials:
(http://www.business-stream.co.uk/)

currently possible elsewhere due to lack of legislation. Others may possibly learn from the Scottish experience.

There should be an inter regional market where authorities can sell their water in a way which would allow a non domestic customer to have an option to buy from various providers."[392]

Comment

The statistics which Business Stream provided can be and have been verified by the various regulators and there have been improvements. Such improvements have been made under the guise of a private company and indeed it is a private company, which is wholly owned by Scottish Water. Until recently however this was a complete monopoly with no 'actual' competition because it owned over 95% of the market and eroding such a monopoly takes time. Companies such as United Utilites have in 2013 started to take large customers from Business Stream. Like all companies facing actual as opposed to theoretical competition their performance in the future can only be guessed but if they are to operate at the same rate of coverage and profit then in the face of new competition as a corporation change will be probable. Although it is privately owned the corporate ethos

[392] Interview with Richard Ackroyd, Chief Executive of Scottish Water. See Appendix 1

in business stream (after visiting the head office, viewing contracts of employment and interviewing several executives) is more similar to that of a public service. The ethos and nature of the company, which provides public service benefits (holidays, work hours, pension contribution[393]) with private sector wages will have to change if it is to compete with companies such as United Utilities, which is a business of a different financial scale and professionalism. This work predicts that in the next decade Business Stream will have a dramatic reduction in market share by possibly around 20 – 30%.

Privatisation in the Scottish water system is not held in the exclusive domain of non domestic customers but in other areas which at first are not apparent to the casual observer. Scottish Water Solutions is an example of this.

Scottish Water Solutions (SWS)

Scottish Water Solutions is a consortium of companies, which contract with private companies to fulfil the needs of Scottish Water.[394] Scottish Water is

[393] Over 30 days annual leave as standard, general 9 – 5 day, pension average contribution of 20% - information provided is from contracts observed.
[394] Morgan Utilities Limited v Scottish Water Solutions Limited [2011] CSOH 112. Paragraph 8 Narrates the legal Composition of SWS: (http://www.scotcourts.gov.uk/opinions/2011CSOH112.html)

within its legal right to both contract with private organisations and form private companies to provide a service to the consumers as narrated in the 2002 Act.[395]

Water infrastructure constantly needs large injections of capital to provide safe and efficient water at the best possible price. Scotland's water provision had not been privatised and it had not seen the necessary injection of capital to renovate upgrade and replace a Victorian system of provision, which was inefficient and costly. This inefficient provision was duly highlighted in 2002 when works and mains were assessed. 78 waste water treatment works failed the compliance tests and 40% were classed as unfit for their purpose. The network of water mains and sewers was also shown as sub standard with 60% of the infrastructure being judged in a poor or very poor condition. Each year decayed pipes were leading to 9,600 bursts.[396] Something immediate needed to be done and capital needed to be spent immediately and efficiently.

Following a consultation exercise by the Scottish Executive, it was established that £2.3 Billion of investment in water quality and waste water

[395] Water Industry (Scotland) Act 2002 Part 3, section 25.
[396]http://www.scottishwatersolutions.co.uk/portal/page/portal/SWS_PUB_ABOUT_US/SWSE_PG_ABOUT_US/SWSE_PG_ABOUT_US_BACKGRND

treatment was required in Scotland by 2006 to meet European Union regulatory standards. The Water Industry Commissioner for Scotland advised that, by achieving economies of scale and incorporating private enterprise the programme could be delivered for £1.8 Billion. This would deliver a saving of £500 million for the customers of Scottish Water.[397] From this Scottish Water Solutions was conceived and formed.

Scottish Water Solutions is a unique company and one of the biggest partnering agreements of its kind, it combines eight companies with considerable experience in a variety of water related fields[398] and places them under the company called Scottish Water Solutions.Scottish Water Solutions has no employees, and is operated by staff seconded from Scottish Water and each of the partner companies.[399] It is a registered limited company with Scottish Water as the majority owner (shareholder) with 51% of the shares in the company, the balance is shared equally by two consortia; UUGM Limited, comprising United Utilities with their construction partners Galliford Try and Morgan Est and Stirling Water Limited, composed

[397] Scottish Water Solutions Annual Report 2003-4: (http://www2.scottishwater.co.uk/portal/page/portal/SWE_PGP_PUBLICATIONS/SWE_PGE_PUBLICATIONS/SWE_PUB_KEYPUB/03_04_SWS_ANNUAL_REPORT.pdf)
[398] Including; Engineering, Water management, Project Management and Construction.
[399]http://www.scottishwatersolutions.co.uk/portal/page/portal/SWS_PUB_ABOUT_US/SWSE_PG_ABOUT_US/SWSE_PG_ABOUT_US_BUS_MODEL

of Veolia Water UK with their construction partners KBR, Alfred McAlpine and Gleeson.[400]

As a result of this amalgamation, Scottish Water Solutions has helped Scottish Water achieve the WIC directive of delivering for £500m less than Scottish Water's original estimate of £2.3bn, savings which were passed on to Scottish Water's customers.[401]Essentially this has privatised a huge section of Scottish Water and this has to a large degree gone unnoticed. SWS will soon have delivered projects up to £1Billion through private means, the justification of this is efficient and professional production.

The key influence on the capital investment programme is (and was) to deliver better value for money and a superior service for Scottish Water's customers as well as environmental improvements to Scotland's rivers and coastlines.Scottish Water's customers, who are paying towards this capital investment programme have thus far benefited by this public private partnership.In addition to this Scottish Water are partnering with other

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400 http://www.scottishwatersolutions.co.uk/portal/page/portal/SWS_PUB_HOME/SWSE_PG_HOME

401 http://www.scottishwatersolutions.co.uk/portal/page/portal/SWS_DELIVERING_MORE_FOR_LESS/SWSE_PG_DELIVERING_MORE_FOR_LESS

private units and are enabling them to provide additional private services under the banner of 'Scottish Water' such as insurance.

In addition to Scottish Water Solutions there are other areas such as insurance (property related) which are private including the provision provided by Homeserve.

Homeserve

Scottish Water has partnered with a multinational Company called Homeserve.[402] Homeserve has been authorised by Scottish Water to provide insurance cover for plumbing and drainage using the 'Scottish Water' logo. Although this cover is for plumbing and drainage and does not have an impact on any of Scottish Water's services the way in which the unsolicited letters have been drafted has caused concern. The problem is that although Scottish Water payments are deduced in total from council tax, individuals may feel that they need to purchase the insurance from Homeserve. Due to complaints that the advertising is intentionally deceptive Consumer Focus

[402] Homeserve Web Page: (http://www.homeserve.com/)

Scotland has reported that it shall investigate the matter.[403] This is another way in which although Scottish Water is not directly a private entity that it is partnering with other private entities.

Should Scotland Privatise

Sir Digby Jones, a previous Director General of the CBI (Confederation of British Industry[404]) has stated unequivocally that Scotland should privatise its water, stating that if Scottish Water remained public it would; " …*expose the Executive, business and the Scottish public to future financial risks…Full privatisation would remove the risk to customers and raise funds for investment in, say, overcoming development constraints or transport infrastructure. Some other model such as mutualisation, would not raise funds for the executive, but it should be considered as an option*."[405]

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[403] "Watchdog probes Scottish Water and insurance Firm" Utilityweek, October 4 2011: (http://www.utilityweek.co.uk/news/news_story.asp?id=195935&title=Watchdog+probes+Scottish+Water+and+insurance+firm)

[404] The CBI is a highly regarded lobbying organisation which focuses on the interests of British Companies: (http://www.cbi.org.uk/about-the-cbi/)

[405] The Scotsman, 17 June 2006: http://www.scotsman.com/business/energy-and-utilities/cbi_backs_calls_for_water_privatisation_1_1122312

Privatisation is becoming more and more of a reality. It may be even said that through the use of Scottish Water Solutions and free competition in the non domestic market that the process of full privatisation has begun. Although such private development has been successful in providing cheaper and more efficient services and full privatisation is backed by many businesses and politicians the negative connotations that reside after Conservative rule have made it politically a precarious concept to advocate.

Water privatisation is still potentially very unpopular[406]. The SNP government will now be focusing on full independence. Alex Salmond the First Minister of the Scottish Parliament and leader of the Scottish Nationalist Party has called a referendum on Scottish Independence, which shall be held in the Autumn of 2014[407]. Privatising Scottish Water may be considered after this referendum, but politically there would be too much to lose and too little (in two years) to politically gain from such a move.

With the water utility market being worth around £1.2 billion in England and Wales, and the success of privatisation to provide a good service at a good

[406] In recent years no polls have been conducted to assess the opinion of the people towards privatisation.
[407] http://www.bbc.co.uk/news/uk-scotland-16478121

price the Scottish Government has for some time been discussing the privatisation of Scottish Water.

As of March 2010, Scottish Water's regulatory asset value (RAV) was £5.4 billion and the net debt was £2.9 billion. By assuming there would be no premium to the RAV (Unlike the current market valuations of most other water companies) Scottish Water would be worth around £2.5 billion. [408] The accountants KMPG are also on record as stating that transforming Scottish Water into a Not for Profit Company could '*generate a £3 billion windfall*' [409]

The true benefit of privatisation as can be seen in the English and Welsh models is that the real value comes not from the sale but from the savings derived from the sale. Iain McMillan, director of employers' organisation

[408] Utility Week, " Is it time to Privatise Scottish Water and Northern Ireland Water?" Feb 2011: http://www.utilityweek.co.uk/news/news_story.asp?id=195026&title=Is+it+time+to+privatise+Scottish+Water+and+Northern+Ireland+Water%3F (Note there is an error at the end of this article – the borrowing from the State to Scottish Water is not 150 Billion – but 150 million)

[409] "*Government says Scottish Water to remain Public*" BBC News 1 August 2010: http://www.bbc.co.uk/news/uk-scotland-10829059

CBI Scotland, said: "*Scottish Water's £150 million-a-year subsidy*[410] *could be freed up to invest in other important projects*.[411]"

Financially there would be a gain in the collection of revenue from the sale, the termination of the annual subsidy and most importantly a saving from the amount that would be spent by the private sector to renovate the deteriorating infrastructure and indeed the amount saved from the loan that would be presumably used to cover that cost. In addition to these benefits efficiency in provision should improve if it is regulated and monitored in a similar fashion to the way in which Ofwat regulates south of the border. Such improvements in efficiency would include ensuring all household customers who receive water and sewage services are billed as it is believed that many currently are not.[412]

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[410] This has now been capped to £140 Million (WICS) The Impact of new improvements on water and sewage bills: Ready Reckoner: http://www.watercommission.co.uk/UserFiles/Documents/ReadyReckoner%20(7).pdf

[411] The Herald 'Storm Brews as privatisation touted for water provider". Sunday 24 January 2010: http://www.heraldscotland.com/business/markets-economy/storm-brews-as-privatisation-touted-for-water-provider-1.1000992

[412] WICS, "*The Strategic Review of Charges 2010-15*" : The Final Determination http://www.watercommission.co.uk/UserFiles/Documents/Final%20Determination%20document.pdf

Future Threats

River and Catchment Management

River and Catchment Management has not been subject to the high levels of criticism that has been thrust south of the border in England and Wales. This is mainly due to the fact that the management system has changed less, and whereas in England and Wales, where the transfer to privatisation left certain catchment management gaps, these gaps are less profound in Scotland. That is not to say that management could not be improved upon, and legislative gaps are still present. One example would be the collection of debris on river banks and beds is still left as a duty which is shared by Local Councils and Local Voluntary Groups such as Friends Of The River Kelvin (FORK).[413] Certain Councils have been seen to be lacking in their duty for debris collection and this is one issue which needs to be remedied.

"*Before, people say that before privatisation there was an effective management system, before privatisation there was not. However there are*

[413] Friends Of The River Kelvin is a voluntary action group dedicated to cleaning the banks and bed of the Kelvin region in the vicinity of Glasgow: (http://www.fork.org.uk/)

different systems in Scotland to England. In England the Environment Agency regulates flood management and local councils have a responsibility for drainage. In Scotland SEPA have no responsibility for flood management, they are the responsibility of the council. Councils are responsible for management. It is true there are problems with this management,

One suggestion would be to create one single body that is responsible for everything; drinking, flooding, sewage etc. Politicians have always looked away as one would be creating a body that was too large but that might not be the case."[414]

The proposal of one single body is also an interesting consideration, flood management as a Council remit essentially permits those who have knowledge of, but are not experts in the area to deal with a situation. In the case of one unified body it could collect and utilise expert knowledge with less administration and less bureaucracy.

[414] Interview with Richard Ackroyd, Chief Executive of Scottish Water. See Appendix 1

Climate

Scotland has not yet suffered from any concerns over drought. This situation is not mirrored in England and Wales who have recent been suffering from drought when Scotland's reservoirs were between 93 and 97% full.[415] Loch Katrine for example is wholly owned by Scottish Water and is used by Scottish Water to provide Glasgow and surrounding regions with its water supply. Loch Katrine has been artificially raised and when required can supply users through the use of pressure alone up to 50,000,000 gallons per day. Regardless of the seemingly constant supply of water, climate change was recognised by Ackroyd to be one of his two biggest concerns relating to the threat to Scottish Water

"*The issue of climate change is one of the biggest issues the industry has to deal with at a national and international level. . . In relation to climate change, most of the predictions envisage more rain. There are therefore*

[415] "South East Latest Part of England officially in drought." BBC News, 20 February 2012:
(http://www.bbc.co.uk/news/uk-england-17102615)

huge implications for drainage and flood prevention and that will have to be dealt with over very many years."[416]

The Public Ownership Constraint

The second constraint deemed most of a threat (or indeed constraint) by its Chief Executive comes not from pollution or regulation but an inability to grow as an enterprise.

"*The second is not a threat but a constraint and that is public ownership. We like most have a non regulated renewable power waste management and this could be grown, but the capital can't be accessed because of the governmental restrictions. If you contrast Pennon / South West Water they were able to access capital and grow. For all business to thrive they need to grow. We can't grow a water business in isolation so we have to grow through other routes, these are however restricted by the current legal setup of the organisation. As long as the Government own Scottish Water the Scottish Government are restricting growth and the ability to access private capital. The only capital is from profits and from the governmental loan.*

[416] Interview with Richard Ackroyd, Chief Executive of Scottish Water. See Appendix 1

I would not want you to state that privatisation, per se, was being advocated by me but financing it on the debt markets would be beneficial, but it needs a political will." [417]

What is being advocated is not 'per se' as stated privatisation, but it is as close to privatisation as one could be without actually being privatised. Mr Ackroyd highlighted that he did not want to advocate Scottish Water being transformed into a private institution, but it must be remembered that politically it would have been almost impossible for him to do so.

Mr Ackroyd did explicitly advocate three changes that would ease the constraint in future years. Firstly the legislation governing the operational management and operational restrictions of Scottish Water would have to be amended. This would incorporate the ability of Scottish Water to expand into other sectors and in addition to accrue financing from the debt market.

The markets of growth were not specified by Mr Ackroyd but considering the variety of investments that other water companies have invested in from

[417] Interview with Richard Ackroyd, Chief Executive of Scottish Water. See Appendix 1

property to insurance the flexibility would open a door to possibly endless investments and revenue streams. The restrictions on the investments and the viability of a publicly owned provider investing in certain environments would obviously be a complex matter and involve further thought and regulation.

The ability to use Debt financing '*Opens up a whole new Universe*' according to Eric Thornberg.[418] Debt financing would bring with it two benefits the first is the obvious benefit of an increase in liquid capital. The second is the incentive brought by having to return the capital to individual investors, from the financial element the human element would also play a considerable part. The external corporate pressure derived from investors was seen to Mr Ackroyd as being an invaluable intangible that would, produce results that only such a pressure could.

"*Powers and flexibility to grow private debt finance in the business. With the stimulus for debt investors, there is real pressure there which is valuable. You get this in a private organisation but it is impossible to completely replicate without these external pressures*."

[418] Interview with Eric Thornberg, Connecticut Water, See Appendix 1.

"*I believe the debate should be what should be the best way for Scottish Water to be financed.*

Should it be financed on the debt market by the Scottish government – then there would be the possibility to refinance existing debt or sell more debt this is currently impossible. Debt finance is something that should be considered in the future."[419]

Mr Ackroyd stated that he though that the private system had benefited the system in England and pushed for a debt finance option. Politically he could not advocate the privatisation of Scottish Water, but he did advocate privatisation.

Effective Provision Analysis

Scotland is the only country in Greta Britain not to have private provision. The purpose of this work is not to compose a comparative account determining the superiority or inferiority of one system be that public or private but to ascertain individually the effective provision of the private

[419] Interview with Richard Ackroyd, Chief Executive of Scottish Water. See Appendix 1

system. For there to be a full and complete account of the system in Great Britain it is however necessary to incorporate Scotland even though the provision for domestic customers is owned and operated by the State. This can be done through the five indicators of effective provision:

Access

Access to water in Scotland as in England and Wales is universal, even in remote locations in Scotland including the many Islands surrounding its coast Scottish Water supplies water and sewerage services.

Quality

There are low levels of pollution in the watercourses of Scotland and the frequent rainstorms means that there is no problem with provision. Currently Scotland is 99.86% compliant with European Standards, which is exceptionally high and similar to he standard of the providers in England and Wales. There has been a consistent improvement over the past several decades since European standards were set across Great Britain. This quality of water is admirable and effectively provides a high quality of water across the Country.

Price

The price of Scottish Water is below the average price paid in England and below that charged in Wales. Pricing water involves many variables and although the water in Scotland suffers less from pollution than districts in the South West of England there are many remote areas which have to be provided with water services at a considerable cost considering how few inhabitants are serviced. The price of the water is affordable, effective and comparatively cheaper than many others.

The price it should be noted of £324 is however an average household bill and differs not in amount of water provided but on council tax band thus the highest taxpayer in 2012 would have to pay £787.14 (tax band H) whereas the lowest would only pay £262.38 (tax band A).[420] Although the lowest is comparatively the lowest of all providers in Great Britain, the second lowest being Severn Trent (£326)[421] the highest charge is also the highest charge in all of Great Britain with south west being the second highest with a charge

[420] Scottish Water Un-metered Charges 2012: (http://www.scottishwater.co.uk/you-and-your-home/your-charges/2012-2013-charges/unmetered-charges)
[421] Ofwat Water Charges 2012 – see spreadsheet: (https://www.Ofwat.gov.uk/regulating/charges/prs_web_charges2012-13)

of £543. Thus you could have a situation that one individual using no water in a year would be charged £787.14 when a household with a constant flow of water in tax band A would be charged £524.76 more than the lowest payment of £262.38. Therefore although the average payment in Scotland is £2 less than the cheapest provider in England there is a massive disparity which you do not have in England as the bills are standardised if un metered. The average price in Scotland is effective as a statistic of average provision but the way in which this average is accumulated although financially effective is unequal and arguably unjust.

Economic

The prime difference between the publicly owned Scottish example and every other water and sewage provider in England and Wales is that the publicly owned Scottish service is dependent on a £140 million 'loan' per year by the Government. Economically if this were a private company this would not be seen to be effective as it is financially not a sustainable operation. It is however sustained through the continuous contribution of the £140 million.

Richard Ackroyd acknowledged this problem in the organisation and stated that he wished to raise money through the debt market as Welsh Water did

and does. This is not however the situation at present and the only way in which Scottish Water, which is the only domestic provider in Scotland, would be able to increase revenue would be to increase revenue through an increase in price or a substantial decrease in operational costs[422].

Environment

Pollution incidents in Scotland are not frequent but they do exist, indeed Scottish Water was fined almost £10,000 (per incident) for two pollution incidents at its treatment works in 2011.[423]

In relation to bathing waters in 2012 only 2% of bathing waters failed standards set by the European Bathing Directive but only 39% met with guideline targets set, the remaining 49 % were above mandatory standards[424] but below the guidelines set[425], mandatory standards are however above

[422] (Business Stream the privately owned company facilitating the water and sewage needs does make a profit, but this is a completely separate entity from Scottish Water.)
[423] "Scottish Water Fined £9,750 for pollution incidents in Ayrshire and North Lanarkshire" SEPA, 30 April 2013
http://www.sepa.org.uk/about_us/news/2013/scottish_water_fined_£9,750_fo.aspx
See also:
Scottish Water Fined over Sewage incident in North Renfrewshire
http://www.edie.net/news/4/Scottish-Water-fined-over-pollution-incident-in-Renfrewshire-/
[424] For information on mandatory standards and guidelines see:
Sepa Webpage:
(http://www.sepa.org.uk/water/bathing_waters/sampling_and_results.aspx)
[425] SEPA Webpage (Summary of Bathing Water Results):

European Requiremants. Scotland however only has three blue flag beaches[426] and lost five from the year 2012 – 2013[427].

Table 5

The SEPA River Basin Management Plan 2009-2015[428] highlights the 2008 water test findings of Rivers and Lochs:

Status	Rivers	Lochs
High	191	61
Good	9434	143
Moderate	4650	48
Poor	300	39
Bad	180	18
Total	2,013	309

(http://www.sepa.org.uk/water/bathing_waters/sampling_and_results/2012_results_summary.aspx)

[426] Blue Flag Webpage: (http://www.blueflag.org/menu/awarded-sites/2013/northern-hemisphere/scotland)

[427] "Drop in Scottish Blue Flag Beaches" 10 June, 2013, BBC: (http://www.bbc.co.uk/news/uk-scotland-22835383)

[428] SEPA River Basin Management Plan http://www.sepa.org.uk/water/river_basin_planning.aspx

Although the majority of the rivers and lochs are in the categories of Good or Moderate there is still room for improvement. In relation to the standars complied with at a European level Scotland is however effective in its role as a caretaker of rivers, lochs, beaches and other water sources and complies with the vast majority of all registered and obligatory standards.

Sustainability

River Basin Management Plan[429] is just one way in which Scottish Water and the Scottish government intend to incorporate sustainability into the provision of water. The plan focuses on a wide range of issues incorporating; rivers, lochs, groundwater, costal water and beaches. It also focuses on the importance of maintaining wetlands. Scotland unlike England is in a situation where the majority of its water catchments are owned both by the Government and the supplier, and example would be Loch Katrine which is owned by Scottish Water and provides all the water for the residents of Glasgow, the largest city and region in Scotland with one in three Scots living within its boundaries. There are still watercourses and watersources which are owned by landowners and there is still the same need to ensure that there is sustainable management of the farmland. Sustainability is an

[429] SEPA River Basin Management Plan
http://www.sepa.org.uk/water/river_basin_planning.aspx

evolving standard and by nature needs to improve as time passes, thus it is not a qualification which can be fulfilled and then left. The Scottish Environment Protection Agency has recognised that there are a variety of water management issues[430] and this sustainable management given high priority in the provision of water.

Conclusion

Scotland can be seen to have an effective provision of service in almost all of the criteria; the quality is above European Standards, there is access to all (without the possibility of domestic cut-off[431]), sustainability and land management is a priority, but with most systems of management there could be improvements. The main areas of concern are financial.

The price is on average lower than the counterparts in England although the way in which this average is calculated means that certain households pay over £500 more for the same service. The secondary and arguably most critical concern is that the whole operation is reliant on the £140 million loan

[430]Significant Water Management Issues
http://www.sepa.org.uk/water/water_publications/swmi.aspx
[431] Domestic cutoff is illegall across Great Britain and shall be discussed later in the text.

which the Government provides to it every year, making it financially unprofitable. Thus the provision is effective but, such an operation could not maintain provision if it had the same constraints as a private company, in addition payments rates also are polarised and inequitable.

Chapter 5

Legislation and Governance

Introduction

With privatisation there has been more and not less regulation. It has been this regulation, which it can be argued, has pushed privatisation into existence with the requirement to adhere to European Standards. In addition, at a national level these new regulations have allowed privatisation to form and operate in a structured and controlled environment. The liberalisation of the markets has brought more, not less legislation, but it is through this legislation that privatisation has been able to operate. This Chapter explains the original roots of water law and develops to incorporate both the National and International laws governing the current system of provision. This work recognises that there is more legislation concerning water than any other utility.

Privatisation and the Increase in Governance and Legislation

"*The real impact of privatisation has been not to withdraw the state from economic activity, but to change its role from a producer to the protective state. It is based on the principle that it is not the legitimate function of the state to be involved in economic production.*"[432]

It initially appears paradoxical to envisage a politically conservative regime promoting the free market and also extending state regulation over the market, but that is what occurred. Indeed it was necessary. Cento correctly states that the role of the state was not diluted in purpose but changed in nature. The institutional change needed a new method of controlling the new market and this was done through the adoption of new legislation and the construction of new regulatory bodies. Privatisation cannot simply be seen as an exchange of property, but it has to be considered holistically and in the case of privatisation in Britain and in the English and Welsh water industries it is intrinsically accompanied with regulation.

The primary measure of the regulatory bodies constructed is to safeguard a

[432] Veljanovski, Cento, "*Privatisation in Britain – The Institutional Constitutional Issues.*" Marquette Law Review, Vol. 71:558, 1988

variety of interests. At a national level three regulatory agencies were established: The Office of Water Services (OFWAT), The Drinking Water Inspectorate (DWI), and the Environmental Agency (EA). These are all encompassed in the Department for the Environment Food and Rural Affairs (DEFRA). Britain is however not only subject to its National Water Legislation but also European Legislation and European Water Legislation.

The Roots of the Law: English and Scottish

The roots of Water Law at a British level have been derived from their Roman roots.

Scotland has three cardinal pillars from which the current law was derived, Roman Law, Cannon Law and the Common Law[433]. In 1949 Lord President Cooper famously described Scots Law as " *An original amalgam of Roman Law, Feudal Law and native customary law, systematised by resort to the law of nature and the Bible, and illuminated by many flashes of ideal metaphysic*."[434]

[433] Macqueen, H "*Studying Scots Law*" Edinburgh, Butterworths, 1999
[434] MacQueen H"The Bible in Scots Law", Scots Law News, 22 August 2010: (http://www.law.ed.ac.uk/sln/blogentry.aspx?blogentryref=8351)

Scotland retained its own system of Private Law after the Union of 1707,[435] a system which is heavily guarded by patriotism and tradition.

In recent years the Law of Scotland has become similar to England and Wales, in many more areas due to a shared court of appeal in the House of Lords, which recently due to the Constitutional Reform Act[436] is now called the Supreme Court of the United Kingdom. In addition to this, Scotland and England are under the jurisdiction of the European Court of Human Rights and the various European Directives and Regulations. Thus Scots Law is a complicated system, which continues to evolve with British and European Legislation

Scots Law has been under the influence of Roman Law considerably more than its contiguous counterpart. English Law has a continuous history which can be shown to derive from the Court of Ethelbert, who reigned over Kent

[435] The Act of Union of 1707 Joined in a mutually agreed document the Kingdom of England with the Kingdom of Scotland into the Kingdom of Great Britain.
[436] Constitutional Reform Act 2005:
(http://www.legislation.gov.uk/ukpga/2005/4/contents)

as King from the year 560 AD – 616 and the customs which comprised these laws, indeed un-codified but present, derive from the Norman Conquest [437]

Whether Water Law was received, derived or incorporated from Roman Law or conceived independently by the natives of the land is not known. The similarity between those ancient laws and the current legislation is however informative.

Roman Law

In Roman Law the extraction of water for consumption is not considered a point which merits explanation, presumably as insufficient litigation had risen over such matters. Roman Law does however classify water into two distinct forms of property, '*Res Publicae'* and '*Res Nullius*': Res Publicae were public things and the ownership of them was vested in the State with the right of use vested in the public. These things included roads, harbours and bridges. Perennial rivers were also classed as Res Publicae although the beds and the banks of the river had separate potentially individual rights. These rights could not prevent other individuals from the use of the public ownership of the river. Such use in addition to swimming, sailing and

[437] Hood Phillips, O "*English Law*" London, 1965

fishing[438] would have included the collection of water for consumption[439]. Res Nullius was different from Res Publicae as the ownership was not vested with any individual or body including the state but was vested in no-one. Thus there is a situation where the property is owned by no individual, but open to public use and belonging to all.[440]

English Law

From a riparian angle English Law is similar to Roman Law in the sense that the water situated on land in itself is not capable of being owned by an individual. The right to navigate through a waterway can be possessed by an individual, but this is a right not to pass over the water, or more technically to pass over the land under the water.[441]

There is a right to receive water, which flows naturally through a channel (from higher to lower land). This was demonstrated in the commonly cited

[438] Justinian, Justinian's Institutes, (Translated by Birks P and McLeod G, Duckworth, 1987) Book II (2.1)
[439] Interestingly there was no roman action available to an individual who had their water through flow impacted by another individual using or diverting their source unless there was a previously founded servitude right to this water. See Johnston, D, "*Roman Law in Context"* Cambridge University Press, 1999.
[440] Borkowski, "*Roman Law*" Blackstone Press, 1997 – See also Justinian, (Justinan's Digest) (Edited by Alan Watson, Penn Press 2009) (On the seashore – 41. 1.14)
[441] *Derwent Trust Ltd v Botherton* [1992] 1 A.C. 425 at 441 per Lord Goff of Chieveley.

Swindon Waterworks Case[442]which importantly ruled that injury or damages were not needed to prove a violation of rights (which is usually the case in such cases of Private Law) and that a lower riparian could protect their right of water from an upper riparian.

If the water does not flow but percolates from a higher to lower landowner there is no right to receive the percolated water[443] regardless of consequences to any neighbours,[444] even if the result is a complete usage of the water causing a depletion or drying up of a neighbour's well[445]. There is however a right of drainage onto lower land. Thus the situation may arise where a lower landowner would not be able to claim the water, which percolates from the higher land nor any redress by potential flooding[446]

[442] Swindon Waterworks Co. Ltd and Berks canal Navigation Co. (1875) L.R. 7 H.L. 697
[443] *Chasemore v Richards* (1859) 7 H.L.C. 376 See also Milton v Glen-Moray Glenlivet Distillery Co (1898) 1 F 135
[444] Stephens v Anglian Water Authority [1987] 1WLR
[445] *Acton v Blundell (1843)* 12 M & W 324 See also Cheshire and Burn "*Modern Law of Real Property"* Butterworths 1994
[446] The lower owner, he may prevent such water from draining onto his land by constructing a barrier between upper and lower land, as long as he acts reasonably in so doing. The water must not revert back to the upper landowners land. See *Home Brewery plc v. Davis & Co* [1987] QB, approved by the CA in *Palmer v. Bowman* [2000] 1 WLR 842

caused by the water[447]. There is also the right to fish, which is possessed by the owner of the land through which the river[448] lies[449].

Scots and English Law

The Law in Scotland[450] as explained above has evolved differently from English Law but shares the Supreme Court with England[451] and is also subject to the same European legislation. Water Law in Scotland is almost identical to that of England bar some Scots Law terms, which are interchangeable with their English Law counterparts.

Expanding on the points highlighted in English Law. In Navigable rivers which are tidal the bed (*alveus*) belongs to the Crown. Individuals are allowed rights over this crown property such as navigation[452] and non permanent mooring[453].

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[447] *Palmer v Bowman* [2000] 1 All E.R. 22. See also *Home Brewery plc v. Davis & Co* [1987] QB
[448] Or indeed Lake or Loch.
[449] Thompson M, "*Modern Land Law*" Oxford University Press, 2003
[450] For more information on water rights including the details of Crown property and salmon fishing refer to : Gloag and Henderson "*The Law of Scotland"* Tenth Edition Sweet and Maxwell 1995
[451] Previously called the House of Lords.
[452] *Crown Estate Commissioners v Fairlie Yacht Slip Limited,* 1979 S.C. 156
[453] See Dictum of Lord McDonald in *Leith-Buchanan v Hogg* 1931 S.C. 204

In non-tidal navigable rivers, the public enjoys a right of navigation even though the alveus is the property of an individual[454]. *In Wills' Trustees v Cairngorm Canoeing and Sailing School*[455] it was stated that the right of navigation is a right for the '*ordinary public*' and cannot be lost by non use[456] and a variety of factors have to be considered in ascertaining a right of navigation such as its use as a route of transport and communication. This founded right of navigation is restricted and the public have no other rights to the river as the banks are private property and can't be used by the public except for purposes, which are incidental to navigation.[457]

Non Navigable Rivers

"*A riparian proprietor is entitled to have the water of the stream on the banks of which his property lies, flow down as it has been accustomed to flow down to his property, subject to ordinary use of the flowing water by*

[454] Robson P and McCowan A, "*Property Law*" Sweet and Maxwell, 2000
[455] *In Wills' Trustees v Cairngorm Canoeing and Sailing School* 1976 S.C. (H.L.) 30 – In the dictum it was stated that the right of navigation cannot be lost by non use and a variety of factors have to be considered in ascertaining a right of navigation such as its use as a channel of transport or communication.
[456] Unlike other legal servitudes (easements)
[457] *Leith-Buchanan v Hogg* 1931 S.C. 204

upper proprietors, and to such further use, if any, on their part in connection with their property as may be reasonable under the circumstances."[458]

As stated in the above dictum primary extraction purposes are permissible by a riparian proprietor, this is the case even if the result is to diminish or exhaust the water supply. If the use is not for a primary domestic purpose and it is for a secondary non domestic purpose such as manufacturing or sale then extraction is not legal if it has an impact on any downstream riparians. In the case where there is pollution an injunction (or in Scotland an Interdict) can be obtained to prevent further pollution.[459]

Surface Water

The water lying on top of an individual's land is his property. This property can be extracted[460] and used for any reason be this domestic, agricultural, manufacturing or sale. If there is a lake (or loch) then if there is one owner

[458] Young and Co v Bankier Distillery Co 1983 20 R. (H.L.) 76
[459] Control of Pollution Act 1974 (http://www.legislation.gov.uk/ukpga/1974/40) as amended by the Water Act 1989 (http://www.legislation.gov.uk/ukpga/1989/15/contents) and the Environment Act 1995 (http://www.legislation.gov.uk/ukpga/1995/25/contents).
[460] Extractions are governed by the Water Resources Act 1991 including extraction licences where applicable.

then that owner has the rights over the water and the fish[461]. If water is surrounded by more than one proprietor, then the loch is owned in common (unless contract otherwise stipulates). If there is ownership for example between two proprietors sharing one Loch then the entitlement of property extends only as far as the half way point to the other bank (owned by the other proprietor)[462].

Table 6

Rights and Responsibilities of Water Ownership and Use.

The Environment Agency have summarised the rights and responsibilities :[463]

Rights	**Responsibilities**
Ownership of the land up to the centre of the watercourse - unless it	The responsibility to pass the flow of water without pollution.

[461] This includes fishing in lakes (lochs), streams, non tidal rivers. Fishing for salmon and in the sea (sea lochs) is a different matter and is affected by crown rights – See Mc Allister A and Guthrie TG "*Scottish Property Law"* Butterworths 1992
[462] *Mackenzie v Bankes (1878)* 3 App C*as 13*
[463] EA Webpage – to view download pdf (http://publications.environment-agency.gov.uk/dispay.php?name=GEHO0407BMFL-E-E)

is known to be owned by someone else	
Right for water to flow onto your land in its natural quantity and quality	Accept flood flow through your land
Right to protect property from flooding, and land from erosion (but subject to approval by the Environment Agency)	To maintain the bed and banks of the watercourse.
Right to fish in the watercourse (subject to various provisions and caveats for example, a license may be required and there may be certain restrictions in relation to what is fished and when).	Keep any culverts, rubbish screens, weirs and mill gates clear of debris
Water extraction is permissible. In certain circumstances (extraction for sale) then an extraction licence will be required.	not cause any obstructions - either temporary or permanent - that would prevent the free passage of fish

Sea

Water and the legislation surrounding it can be easily divided into two distinct categories; sea water and non sea water. An owner of land adjoining the sea is entitled to the sea shore down to a point which is reached by an ordinary high tide[464]. Territorial (Sea) Waters are vested in the Crown[465] and are governed by the Territorial Sea Act[466], which dictates that this ownership stretches to 12 international nautical miles from the baselines from which the sea is measured. This limitation does not mean that all international water cannot be recognised as being owned by a private individual. In certain circumstances such as deep sea mining it is possible to appropriate areas within the sea if there is sufficient justification.[467] If there is not a Crown Grant, Statute or Prescriptive Right the use and ownership of the sea is limited. There is a public right to navigate, moor, load and unload but this does not include any right to permanently stay in one location.[468] The restrictions of use and ownership, which relate to the sea are not similar to

[464] Government of Penang v Beng Hong Oon [1972] AC 425
[465] *Lord Advocate v Clyde Navigation Trs* (1891) 19 R 174
[466] Territorial Sea Act 1987 as amended by the Territorial Sea (Amendment) Order 1998
[467] Deep Sea Mining (Temporary Provisions) Act 1981
[468] As regulated by the Coast Protection Act 1949

the legislation governing the other sub category of water which is freshwater.[469]

European Law (Direct Effect)

Cooperation in Europe was seen as a necessity after 1945. Since then there has not been conflict between the members of the European Union and to this degree Europe within a Community context has been a success[470]. From its origins of the European Economic Community and the European Coal and Steel Community the political union developed and established a new European order with the establishment of the European Union with the Maastricht Treaty in 1992[471] This European integration gradually produced super-nationalism[472]. Integration has been realised by a variety of measures including a single market and a standardised systems of laws. Within these laws are laws governing water.

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[469] For more information on Territorial Waters and the High Seas

[470] This is not to say that there has not been conflict in the Continent as opposed to the community. An example the conflict in 1995 in Bosnia. It should be noted Bosia has applied for EU membership and listed as a '*potential candidate for membership*'

[471] The Maastricht Treaty 1992: (http://www.eurotreaties.com/maastrichtec.pdf)

[472] For more on the development and integration in theory and practice of Europe see: McCormick, J "*Understanding The European Union"* Palgrave 1999

Both England and Scotland under the British Parliament are subject to measures imposed by the European Parliament as members of the European Union.

European Legislation has two main forms of integration that of Direct Applicability and of Direct Effect.

Direct Applicability

Direct Applicability was established as a legal concept and obligation within the Treaty on the functioning of the EU[473]. Direct Applicability is where Member States are obliged to incorporate and transpose Community Law into National Law and practice. This transposition is necessary as some legislation is (or was) not automatically incorporated from European to National Law.[474]

[473]Treaty on the Functioning of the European Union – see article 288 (http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2010:083:0047:0200:en:PDF)
[474] Foster, N "*EC Law"*Blackstone Press, 2000

Direct Effect

Direct Effect doctrine was first articulated in the case of *Van Gend en Loos*.[475] This is the term used to describe the rights and responsibilities of individuals in European Member States and the enforcement of those rights and at what point Community Law applicable to Direct Effect becomes enforceable. The enforceability of legislation which is seen as having direct effect is immediate. Thus the European legislation would not need any further national ruling or localised implementation for it to be binding in National Law. Therefore if legislation, with direct effect, had an influence on the water legislation of a Member State such as the United Kingdom of Great Britain, including England and Scotland then this in turn would be the law, overriding previously possible conflicting national legislation, which both the State and individuals must confer to.

The *Van Gend en Loos* case stipulated criteria (the Van Gend criteria)

[475] Van Gend & Loos v Netherlands Inland Revenue Administration. European Court of Justice 1963: (http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:61962J0026:EN:NOT)

The Provision must be: clear, negative, unconditional, containing no reservation on part of the Member State, not dependent on any National implementing measure. The three core forms of statutory legislation have been shown to have the potential (providing the criteria is fulfilled) to have direct effect. This includes Treaties (as shown in the Van Gend Case) Regulations[476] and Directives[477].

Directives have been the main source of legislation relating to Water Law in Europe. Without delving into the details of European Community Law[478] it should be noted that there are two forms of direct effect; vertical direct effect and horizontal direct effect.

Vertical

Vertical direct effect concerns the relationship between the Member State and the European Community and enables individuals to bring actions against the Member State if there is non-compliance with Community legislation.

[476] Leonesio v Ministero dell' Agricotura e delle Foreste [1972] ECR 287, [1973] CMLR 343
[477] Van Duyn v Home Office[1974] ECR 1337, [1975] 1 CMLR
[478] For further reading regarding Direct Effect See; Craig and De Burga '*EU Law'* Oxford University Press 1998

Horizontal

Horizontal Direct Effect deals with individuals (both personal and corporate entities). It allows the legislation to be enforceable not only from individual to Member State (an individual enforcing the law of the European Community against their State – if that State's national legislation conflicts) but from individual to individual. Directives can however only be enforced against the State and not private individuals or corporate entities.[479] If therefore an individual brings an action against a corporation (as opposed to the Member State) for a breach of legislation then it will not be successful. In the case of *Duke v Reliance* this was shown when an employee brought an action against her employer for forcing her to retire two years before her male counterparts.[480] If the employer was the State and the action was against the State and not a private individual then there would be a valid action. This leaves two interesting points first a public sector worker would have an action (against their employer, the state) whereas a private employee may not. Secondly what is determined as private and public is not uniformly agreed across Member States and may vary from Member State to Member State. For this Thesis it is important to recognise that Nationalised

[479] *Marshall v Southampton Area Health Authority* [1986] ECR 723
[480] *Duke v GEC Reliance Systems Limited* [1988] 1 CMLR 719

Industry/Corporate Entity (Such as Rolls Royce) which is/was wholly owned by the State is not deemed to be an emanation of the State[481], unlike for example the police[482], and cannot be held to be responsible as the State.[483] Thus relating these facts to the Water Industry not only would an action from individual to individual relying on the direct effect of European legislation be invalid by an individual in the once public Water Authorities in England but Scottish Water although owned by the State as a private company would not be seen as part of the State.

This does not alter the fact that England and Scotland have to comply with Treaties, Regulations and Directives. European super-nationalism, once considered is now a practical and legal reality and in the hierarchy of the legal system in its Member States its laws must be adhered to and implemented.

European Legislation

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[481] The Term '*Emanation of the State'* was used in *Foster A and Others v British Gas* as " *A body, whatever its legal form, which has been made responsible, pursuant to a measure adopted by the state, for providing public service under the control of the state and has for that purpose special powers beyond that which result from the normal rules applicable in relations between individuals*." *Foster A and Others v British Gas* [1990] ECR I-O3313

[482] *Johnson v Chief Constable of the RUC* [1986] ECR 1651

[483] *Doughty v Rolls Royce plc* [1992] 1 CMLR 1045, see also *Foster v British Gas Plc* [1990] ECR I-03313

Laws governing countries within the European Union including England and Wales are compelled to be in alignment with what is conventionally termed as the Water Framework Directive.[484] This Directive was made on the 23rd of October 2000 and was implemented on the 22nd of December 2000.

The European legal concept of 'direct effect' applies not only to Regulations but also Directives.[485] This imposes an obligation for each Member State to ratify the principles narrated in each Directive. This should be done by the transposition of the Directive into National Law. Breach of such legislation can lead not only to international disrespect but imposed community pecuniary sanctions including fines. There are many Directives and Regulations which relate to water,[486] the most pertinent of those are noted below:

[484] Directive 2000/60/EC of the European Parliament and of the Council of 23 October establishing a framework for Community Action in the field of Water Policy.
[485] Grad v Finanzamt Transtein, Case 9/70 [1970] ECR 825
[486] For further information on other water related directives see, "Handbook for Implementation of EU Environmental Legislation" Regional Environmental Centre, Publication funded by the European Union, 2008:
(http://ec.europa.eu/environment/enlarg/handbook/handbook.htm)
Section 5 (http://ec.europa.eu/environment/enlarg/handbook/water.pdf)

The Water Framework Directive[487]

The Water Framework Directive is an ambitious and extensive piece of European legislation and covers three forms of water; ground water, surface water (rivers, lakes / lochs), and transitional waters which connect to the sea.

The Framework Directive is built on four pillars:

One – co-ordinated action to achieve what the Directive perceives as a 'good status' for all EU waters by 2015.

Two – the setting up of water management systems based on natural river basins.

Three – incorporating integrated water management

Four – involvement of interested parties and the public.

[487]Directive 2000/60/EC, 23 October 2000 (The Water Framework Directive) (Repealing Directive 80/778/EC)
(http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2000:327:0001:0072:EN:PDF)
For a Summary of the Directive see:
(http://europa.eu/legislation_summaries/agriculture/environment/l28002b_en.htm)

The definition of 'good chemical status' has been defined by environmental quality standards and tests for various chemical substances, or indeed the lack of the substances.

Monitoring is a main facet of the Directive and of Integrated Water Management. This has been broken into three types of monitoring: surveillance monitoring measures long-term trends, operational monitoring monitors the progress and development of the waterways and investigative monitoring which necessitates deeper investigations.[488]

Integrated River Basin Management is also a large part of the implementation of the Directive. On 22 December 2009 following responses to the Draft Management Plans, the River Basin Management Plans were published for England and Wales.[489] The Management Plans aim to do many things including: preventing deterioration of the water within the Member States, enhance and restore waterways, to ensure good chemical and ecological balances in the waterways, to reduce pollution, to protect and

[488] How The Water Framework Directive helps safeguard Europe's resources, European Commission, 2010. (http://ec.europa.eu/environment/water/pdf/WFD_brochure_en.pdf)
[489] All the current plans can be seen on the Environment Agency's webpage: (http://www.environment-agency.gov.uk/research/planning/33106.aspx)

enhance both surface and groundwater and to preserve protected and environmentally important areas.[490]

The fourth pillar to include interested parties and the public is an incorporation of holistic measures into the Directive. There are two main reasons for such participation. Firstly, for a comprehensive management plan which takes into consideration all affected stakeholders it is necessary to communicate with and obtain the thoughts of various individuals and groups at ground level, or more appropriately 'water level'. The second reason concerns enforceability; '*The greater the transparency in the establishment of objectives, the imposition of measures, and the reporting of standards, the greater the care Member States will take to implement the legislation in good faith, and the greater the power of the citizens to influence the direction of environmental protection, whether through consultation or, if disagreement persists, through the complaints procedures and the courts. Caring for Europe 's waters will require more involvement of citizens, interested parties, non-governmental organisations (NGOs).*'[491]

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[490] "*Water Protection and Management (Water Framework Directive)*" Europa Webpage: (http://europa.eu/legislation_summaries/agriculture/environment/l28002b_en.htm)
[491] 'Introduction to the Water Framework Directive' European Commission Webpage: (http://ec.europa.eu/environment/water/water-framework/info/intro_en.htm)

The Drinking Water Directive[492]

The Drinking Water Directive is concerned with ensuring that water used for human consumption is palatable.

Member States are under obligations to monitor their water, report the findings and improve if necessary. Drinking water should not contain anything, which is for example unhealthy for humans to consume including parasites.[493]

In addition parameters are given in relation to the composition of aluminium, ammonium, chloride and radioactive substances such as tritium.[494]

The Directive is very cautious in relation to its prescribed measures and indeed a comparison with the guidelines prescribed by the World Health

[492] Directive 98/83/EC, 3 November 1998, quality of water intended for human consumption, (The Drinking Water Directive) (http://eur-lex.europa.eu/LexUriServ/site/en/consleg/1998/L/01998L0083-20031120-en.pdf)
[493] The Aforementioned Directive, Article 4.
[494] The Aforementioned Directive, Annex I, Part C.

Organisation shows that both are in harmony, where there are differences the European measures are more stringent.[495]

An annual Drinking Water Report is published in England and Wales by the Drinking Water Inspectorate.[496] Every three years the Member States must report their results to the European Commission.[497]

The Beaches and Bathing Water Quality Directive[498]

The Bathing Water Directive's role is to ensure the constant monitoring and improvement of the water surrounding and the land on the beaches and foreshore.

It obliges Member States to: monitor their beaches, report their findings and improve their standing (if necessary).

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[495] "*Guidelines for Drinking Water Quality"* World Health Organisation, 2008: (http://www.who.int/water_sanitation_health/dwq/fulltext.pdf)
[496] The DWI shall be discussed later in the Thesis .
[497] The Aforementioned Directive, Article 9.
[498]Directive (2006/7EC) concerning the management of bathing water quality and repealing Directive 76/160 EEC (The Bathing Water Directives) (http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32006L0007:EN:NOT)

Microbiological and physio-chemical standards are incorporated into the Directive's monitoring which obliges Member States to comply with the 'Mandatory' standards and endeavour to comply with the 'Guideline' standards. In England and Wales monitoring and compliance is responsibility of the Environment Agency and in Scotland this is devolved to the Scottish Environment Protection Agency.[499]

The Directive ensures that when the beaches are monitored (by standard measures that are then allocated a classification category: Excellent, Good, Sufficient or Poor).[500]

Reports are due annually from all Member States. From the collected data a master report is created annually to assess the water quality.[501] The most recent report demonstrates that the Members States have generally bathing water which is indeed safe to bathe in and indeed the United Kingdom was

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[499] "*The Bathing Water Directive"* Department For The Environment and Rural Affairs, 24 February, 2011: (http://archive.DEFRA.gov.uk/environment/quality/water/waterquality/bathing/index.htm #waterdirective)

[500] The European Commission has produced a fully comprehensive explanatory document; "*Bathing Water Profiles, Best Practice and Guidance"* EC, December 2009: (http://ec.europa.eu/environment/water/water-bathing/pdf/profiles_dec_2009.pdf)

[501] European Bathing Water Quality in 2011, European Environment Agency, 2011: (http://ec.europa.eu/environment/water/water-bathing/report2012/report.pdf)

one of eleven countries where more than 80% of the bathing waters were classed as 'Excellent' (82.8% in the United Kingdom).

"Overall in 2011, 92.1 % of bathing waters in the EU met the minimum water quality standards set by the bathing water directives. Bathing water quality increased at 0.6 % of sites in 2011 compared to 2010. The proportion of bathing waters with excellent quality (or complying with the more stringent guide values) increased by 3.5 percentage points compared to 2010, reaching 77.1 %. The share of non-compliant bathing waters was 1.8 %, which was a 0.1 percentage point increase from 2010. In 2011, 207 bathing waters were banned or closed (1 %), which was 57 more than in the 2010 bathing season… In 11 countries — Cyprus, Malta, Croatia, Greece, Germany, Romania, Portugal, Austria, Ireland, United Kingdom and Italy — more than 80 % of bathing waters achieved excellent"

Improvements can be seen across Member States including the United Kingdom.[502][503] Since 1998 The UK had just above 20% of beaches within

[502]"*Good News In Bathing Water Report*" European Commission, 23 May 2012: (http://ec.europa.eu/unitedkingdom/press/frontpage/2012/12_55_en.htm)
[503] "*Bathing Water Results 2011 – The United Kingdom*" European Environment Agency 2011. UK results and other Member State Results can be seen below: (http://www.eea.europa.eu/themes/water/status-and-monitoring/state-of-bathing-water)

compliance of environmental guide values, which is now 82.8% compliant with guide values and 97.4% compliant with mandatory values, an increase from 2008 statistics which were 68.3 % and 95.4 % respectively.

The Urban Waste Water Treatment Directive[504]

This Directive essentially states the requirements, which relate to the collection and the treatment of waste-water. It targets both industrial and domestic waste and is technically specific. It also urges Member States that both waste-water and the sludge residue is reused when possible.[505]

Scottish Legislation

Scottish Water Utility Legislation is found mainly in three Acts: [506] the Water Industry Scotland Act 2002[507], the Water Environment and Water

[504] Directive (91/271/EEC), concerning urban waste water treatment, 21 May 1991 (Urban Waste Water Treatment Directive): (http://ec.europa.eu/environment/water/water-urbanwaste/directiv.html) (http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:1991L0271:20081211:EN:PDF)
[505] Article 12 and 14 of the aforementioned directive.
[506] These Acts have been discussed in the preceding Chapter.
[507] The Water Industry Scotland Act 2002: (http://www.legislation.gov.uk/asp/2002/3/contents)

Services (Scotland) Act 2003[508] and the Water Services Scotland Act 2005.[509]

English and Welsh Legislation

In 1963 River Authorities were created by the Water Resources Act of 1963[510]. This Act dealt with issues such as river pollution and the drainage of land. The administration and the responsibility of water services remained within the remit of the local authorities until the Water Act of 1973[511]. In 1973 The Water Act created the ten regional water authorities. These authorities were not composed around previous local government catchments, but were constructed with consideration to natural water basins.

Privatisation came in the form of the Water Act of 1989[512], which transferred the environmental functions to the National Rivers Authority, which in 1995

[508] The Water Environment and Water Services (Scotland) Act 2003: (http://www.legislation.gov.uk/asp/2003/3/contents)
[509] The Water Services Scotland Act 2005: (http://www.legislation.gov.uk/asp/2005/3/contents)
[510] Water Resources Act 1963: (http://www.legislation.gov.uk/ukpga/1963/38/pdfs/ukpga_19630038_en.pdf)
[511] The Water Act 1973: (http://www.legislation.gov.uk/ukpga/1973/37/contents)
[512] The Water Act 1989 (http://www.legislation.gov.uk/ukpga/1989/15/contents)

with the Environment Act[513] became the Environment Agency[514]. Privatisation also transferred (through sale) the ownership of the provision of water services from the Local Authorities to the Government, it did not however change the boundaries of the water regions. After the Water Act of 1989 there have been four main national statutes of great import to water law: The Water Resources Act 1991[515], The Water Industry Act 1991[516], The Water Industry Act 1999[517], The Water Act 2003[518].

Water Resources Act 1991[519]

The Water Resources Act was introduced with four other pieces of legislation to consolidate existing water legislation: The Water Industry Act, The Land Drainage Act[520], The Statutory Water Act[521] and the Water

[513] The Environment Act 1995: (http://www.legislation.gov.uk/ukpga/1995/25/contents)
[514] The Environment Act 1995, Section 3
[515] Water Resources Act 1991: (http://www.legislation.gov.uk/ukpga/1991/57/contents)
[516] Water Industry Act 1991: (http://www.legislation.gov.uk/ukpga/1991/56/contents) & Pdf (http://www.bwca.co.uk/legal/water_industry_act_1991.pdf)
[517] Water Industry Act 1999: (http://www.legislation.gov.uk/ukpga/1999/9/notes/contents)
[518] Water Act 2003: (http://www.legislation.gov.uk/ukpga/2003/37/contents)
[519] Water Resources Act 1991: (http://www.legislation.gov.uk/ukpga/1991/57/contents)
[520] The Land Drainage Act 1991:

(Consequential Provisions) Act[522]. This Act outlines the responsibilities of the newly formed Environment Agency, which was previously the National Rivers Authority. It also empowers the Environment Agency to prosecute to a criminal level against both individuals and corporations who are responsible for committing crimes, which have a harmful effect on the purity of water.[523]

Water Industry Act 1991[524]

The Water Industry Act is a colossal piece of legislation, which comprehensively covers water and sewage legislation. It is divided into eight parts and has a further fifteen schedules. It is to date the largest piece of National legislation ever devised.

Part 1

(http://www.legislation.gov.uk/ukpga/1991/59/contents)
[521] The Statutory Water Companies Act 1991:
(http://www.legislation.gov.uk/ukpga/1991/58/contents)
[522] The Water Consolidation (Consequential Provisions) Act 1991:
(http://www.legislation.gov.uk/ukpga/1991/60/contents)
[523] Sections 80 – 103 describe pollution offences and the powers to prevent them.
[524] Water Industry Act 1991:
(http://www.legislation.gov.uk/ukpga/1991/56/contents)

The appointment of Ofwat (Water Services Regulation Authority).

Part 2

The appointment and regulation of the private providers '*undertakers*'.

Part 3

The duties of the providers in relation to water services.

Part 4

The duties of the providers in relation to sewerage services.

Part 5

Financial provisions relating to operation including a restriction to charges by the provider to the customer.

Part 6

Providing various powers for the utility providers to discharge their duty.

Part 7

The provision of information to interested stakeholders and the duty to produce reports.

Part 8

This section deals with a variety of miscellaneous provisions and includes the right to prosecute water providers, if they commit an offence.

Water Industry Act 1999[525]

This serves various purposes. It empowers consumers with a number of provisions, most importantly it prohibits the disconnecting of water to domestic customers due to non payment.[526] From a Scottish perspective the

[525] Water Industry Act 1999: (http://www.legislation.gov.uk/ukpga/1999/9/contents)
[526] Part 1, Section 1a and Schedule 4a of the aforementioned Act.

Act dissolved the Scottish Water and Sewerage Customers Council and established the Water Industry Commissioner for Scotland.[527]

Water Act 2003[528]

The Water Act with the Water Industry Act 1999 amends the Water Industry Act 1991. The new regulatory changes are contained between sections 34 to 56 of the Act. The main functions are to establish a new regulatory authority The Water Services Regulatory Authority. Although under section 34 of the Act the Office of the Director General of Water Services (Ofwat) was abolished, the new authority is still known as Ofwat.[529]

In addition the Consumer Council for Water was established and section 35 abolished the previously established Consumer Councils for Water. The Council is a non-departmental public body sponsored by the Department for the Environment and Rural Affairs.

[527] Section 12 of the aforementioned act.
[528] Water Act 2003:
(http://www.legislation.gov.uk/ukpga/2003/37/contents)
[529] Department for the Environment and Rural Affairs, Webpage:
(http://archive.DEFRA.gov.uk/environment/quality/water/industry/wa03regs/index.htm)

The regulatory bodies (such as Ofwat), their functions and effectiveness shall be discussed in the following chapters.

The little known topic of Water Law covers a vast array of legal subjects; Property Law, Environmental Law, Human Rights, Admiralty, Commercial Law and has a both National, European and International dimension. Its range is vast and deep. Nationally the most extensive piece of legislation was and is on Water Law. The volume of legislation however can never be described as inordinate or excessive when related to the importance of the provision of clean water.

The legislation established a structure of provision through which water (including sewage) privatisation was established, governed and regulated. The viability and progress of the structure must not only be comprehensive in length and depth, but the actual system of provision and its success must be analysed.

Conclusion

There is no shortage of legislation covering the water sector. (In addition to what has been mentioned in this chapter Sustainability will be focused on in

the penultimate chapter of the Thesis) The initial 1998 Water Act was the largest piece of legislation ever to be passed at Westminster and both comprehensive and detailed in both the duties of the provider and the mechanisms of provision. In addition to this there is supplementary National and European legislation which maintains not only national integrity but international standards of provision which must (and are) be adhered to. The legislation is vast and complex and will with time modify and change to make even greater improvements and cover new areas such as sustainability.

Since the introduction of the European standards through the various levels of European legislation passed, the water quality in all three countries in Great Britain has improved, both the quality of the water to the end user and the environment of the waterways. For a full and comprehensive analysis the elements of effective provision must be isolated and analysed to ascertain exactly what elements have changed since privatisation as is done in the following chapters[530].

[530] The elements of effective provision have been analysed for Scottish provision in a separate section of the thesis to separate the public from the private.

Chapter 6

England and Wales

Introduction

" *These reforms have delivered an impressive volume of new investment, full compliance with the world's most stringent drinking water standards, a higher quality of river water and a more transparent water pricing system.*[531]"

Water privatisation was and still is a very emotive subject; some writing that the privatisation was merely an excuse for profiteering, which has resulted in a poor service and others that the privatisation has not only saved the industry but improved provision. Some academics such as Ven Den Berg of the World Bank are convinced that privatisation has been a positive thing but these statements must be verified through analysis.

[531] Van Den Berg, Caroline, "*Water Privatisation and Regulation in England and Wales*" Public Policy for the Private Sector, The World Bank Group, Note Number 115, May 1997

A valuable way to analyse whether privatisation has led to an effective system of provision is by determining if key performance criteria have been satisfied, which shall be done for both Wales and England as previously analysed for Scotland.

Before the analysis of the system can be done the way in which the system structurally changed must be observed and the backbone to that structure lies within its regulatory monitors. These monitors will be described and evaluated and their role, especially that of the principal monitor Ofwat, shall be scrutinised. After this England and Wales will be analysed in Parts 2 and 3 respectively.

Part 1

Efficiency and the Increase of Legislation

The principle of increased efficiency is one of the foremost arguments used by the advocates of privatisation and indeed was used by the Thatcher government in proposing the initial concept. The initial proposals of the Government's White Paper identified that the private sector clearly stated the Government's view on the future provision of the service.[532] Advocates of private provision state that the private sector will be able to provide a more efficient service at a lower price.

Private, as opposed to public management and provision of a profitable asset can result in greater output. This is however restricted by the institutional framework and legislation within which these firms operate.[533] Since privatisation, legislation and its 'institutional framework' has increased and continues to increase to meet the needs of both the government and the

[532] HMSO, "*Privatisation of the Water Authorities in England and Wales*" (1986a), White Paper, Cmnd 9734, HMSO, London

[533] Yeaple S, Moskowitz W " The Literature on Privatisation" Federal Reserve Bank of New York, Research Paper 9514, 1995 (http://www.ny.frb.org/research/staff_reports/research_papers/9514.pdf)

customer while maintaining the commercial rights of the organisation. Structurally the governance is controlled and monitored by various governmental and quasi governmental regulatory departments. The largest of which is the Department for Environment, Food and Rural Affairs (DEFRA).

The Regulators

The responsibilities of the Regulators were aptly summarised by Richard Allison of South East Water:

"*It is essential that customers are supplied with reliable and safe water. The different regulators we deal with are responsible for different aspects of our water supply. The Drinking Water Inspectorate (DWI) ensures that legally defined quality standards are achieved. The Environment Agency (EA) approve our water resource plans to ensure that adequate long term water capacity is available. Ofwat, the economic regulator sets prices and monitors our overall performance. The Consumer Council for Water (CCW) acts as a consumer body and provides an opportunity to review our strategy and interface with customers to ensure the best interests of customers are*

adequately considered. Although there are at times tensions between ourselves and the regulators the system of regulation has generally worked well since privatisation."[534]

The Department for Environment, Food and Rural Affairs[535] (DEFRA)

The Department for Environment, Food and Rural Affairs was formed in 2001 and was the result of an amalgamation of various Governmental Departments when the Ministry of Agriculture, Fisheries and Food (MAFF) was merged with the Department of Environment, Transport and the Regions (DETR). The Department both creates policy and legislation as well as ensuring its delivery. It is a very large department with a variety of areas which include: the Natural Environment, Biodiversity, Plants and Animals, Sustainable Development, Food, Farming, Fisheries, Animal Health, Environmental Protection, Pollution Control and Rural Community Issues.[536]

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[534] Interview with Richard Allison of South East Water limited, See Appendix 1
[535] The Department for Environment, Food and Rural Affairs (http://www.DEFRA.gov.uk/)
[536] A link to The DEFRA Annual Report 2011/12 can be found below: (http://www.DEFRA.gov.uk/publications/files/pb13805-DEFRA-annual-report-2011-12.pdf)

It is headed by a Secretary, who is the Secretary of State and a Member of the British Cabinet. In addition the Secretary is aided by a Supervisory Board which include both Members of Parliament and the Civil Service, who are permanent members.[537]

DEFRA has many sub departments which are called Key Delivery Partners. In relation to water these include the Environment Agency and the Consumer Council for Water.

The Environment Agency[538]

(EA)

The Environment Agency describe themselves as an '*Executive Non-departmental Public Body responsible to the Secretary of State for Environment, Food and Rural Affairs and a Welsh Government Sponsored Body responsible to the Minister for Environment and Sustainable Development*.'[539]

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[537] DEFRA Supervisory Board: (http://www.DEFRA.gov.uk/corporate/about/who/management/)
[538] The Environment Agency (http://www.environment-agency.gov.uk/)
[539] Environment Agency Webpage: (http://www.environment-agency.gov.uk/aboutus/default.aspx)

The prime role of the Environment Agency is in the protection of the environment and in the advancement of Sustainable Development.[540] In relation to water the environmental regulation is carried out by the Environment Agency ranging from flooding control to pollution. Just as the quality of the environment is monitored by the EA, the Drinking Water Inspectorate is responsible for the quality of the water for consumption. The EA has the power to prosecute offenders who may (for example) pollute waterways.

The Drinking Water Inspectorate[541]

(DWI)

Established just after privatisation in 1990 the Drinking Water Inspectorate was founded as a check, independent of Government to ensure the safety of water provided to consumers.Its main roles are described as:

[540] Environment Agency Corporate Plan 2011-2015: (http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/geho0211btkv-e-e.pdf)
[541] Drinking Water Inspectorate (http://dwi.DEFRA.gov.uk/)

Providing independent scrutiny of water companies and their activities for the benefit of the consumer.

Working with stakeholders to provide safe and secure drinking water

To commission research on the quality of drinking water and publishing data relating to the quality of the water.[542]

Importantly the DWI make sure that drinking water is in compliance with National and European Standards and is thus fit for consumption. Its independence gives it the power to do this without governmental interference, yet it has been provided with enough power to adequately and impartially investigate and if necessary bring prosecutions against those who violate legislation, just as the EA could prosecute for the pollution of a waterway.[543]

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[542] Drinking Water Inspectorate Strategic Plan 2010-2015: (http://dwi.DEFRA.gov.uk/about/our-strategic-plan/Securing-safe-clean-drinking-water.pdf)
Annual Reports 2001 – 2011 can be found in the link below: (http://dwi.DEFRA.gov.uk/about/annual-report/index.htm)
[543] The Water Supply (Water Quality) Regulations 2000: (http://dwi.DEFRA.gov.uk/stakeholders/legislation/ws_wqregs2000_cons2010.pdf)

The third main strand to the regulation of water in England and Wales (EA monitoring the environment, DWI monitoring quality) is the best known as the Water Services Regulation Authority or more commonly as Ofwat. Before discussing Ofwat it is apt to mention the redress that consumers have when faced with water which they believe to be of an unacceptable standard. This consumer representative body is (now called) the Consumer Council for Water, but individuals were initially represented, by Customer Service Committees.

Customer Service Committees

Previous to privatisation local and customer's interest were represented through the local authorities and later through what was termed as Consumer Consultative Committees which were comprised of a mixture of members of the Water Authority and of employees of the Local Authority .

In 1989 when the utility became independent of State provision, ten regional Customer Service Committees were established by the Director General of Ofwat. In addition to this the Director General established the Ofwat National Customer Council, which was comprised of the ten chairs of

the Customer Service Committees and the Director General with the objective of representing the customers' interests at a National and trans-boundary level ensuring that companies not only have a complaints procedure but that the procedure is in use and is adequate.[544]

In an industry with a resource as important as water it is essential that there is not only a provision of service from the 'top down' but also an effective way to provide 'bottom up' communication as the end user is dependent upon the supply and provision by the private company, or authority.

"*It is nevertheless clear that the new regulatory arrangements represent a substantial improvement on those that previously operated under public ownership. The CSCs (Customer Service Committees), when compared with their previous counterparts, the CCCs (Consumer Consultative Committees), are independent of the Water plcs, have their own staff, have support on legal, technical and policy matters from OFWAT staff and have*

[544] Ogden S and Anderson F "Representing Customers' Interests: The Case of the Privatised Water Industry in England and Wales"

much broader terms of reference. Moreover they have more extensive powers, including the 'clout' of the regulator behind them." [545]

In April 2002 the Regional Committees and the National Council collectively adopted the name 'WaterVoice'.

Consumer Council For Water

The Consumer Council for Water now represents both water and sewerage consumers and has done since it replaced the role of WaterVoice on the 1st of October 2005. It acts both for the individual and the collective in representing the needs and rights of the consumer by representing consumers and voicing their complaints.[546] It has legal standing to represent the interests of the consumers as stated under Section 27 of the Water Industry Act 1991 as inserted by section 35 of the Water Act 2003.[547] The Council is classed as an executive non-governmental department and although independent is

[545] Ogden S and Anderson F "Representing Customers' Interests: The Case of the Privatised Water Industry in England and Wales"
[546] The Consumer Council for Water: (http://www.ccwater.org.uk/server.php?show=nav.1300)
[547] See DEFRA's Framework Document on the Consumer Council For Water: (http://www.ccwater.org.uk/upload/pdf/frameworkdocument.pdf)

under the Department for the Secretary of State for Environment and Rural Affairs.

Water Service Regulation Authority

"Ofwat"

"In 1989, Thatcher privatised Great Britain's publicly owned regional water authorities, which were sold off to private companies at bargain prices... They were given licenses to run the water systems without competition for twenty five years as well as free reign to charge what they liked, lay off employees and make as much profit as they could."[548]

Barlow's accusation of the corporations being able to 'charge what they want' is clearly lacking in factual basis. The corporations are monitored with great rigour by Ofwat who ensures that prices are set at a rate which the regulator deems acceptable for both the operator and the customer.

[548] Barlow, Maude "*Blue Covenant*" The New Press, 2007

Ofwat's Structure

Ofwat was established in conjunction with privatisation to monitor the private sector and in specific water prices. It is not however beholding to either the government or companies and has powers accountable only to Parliament. Ofwat is governed and managed by a board which is appointed by the Secretary of State. It is a very transparent organisation with published Rules of Procedure[549] and in addition it publishes its Board Minutes[550]. The structure is similar to many organisations and is headed by a Chairman (Mr Jonson Cox as of 2012) and in addition the Board is comprised of a Chief Executive and other Executive Board Members.

Ofwat's Responsibilities

Ofwat's primary duty was and is to regulate the water providers through pecuniary means.[551] This can be divided into two sections firstly Ofwat has

[549] Rules of Procedure for the Water Services Regulation Authority (Ofwat): (http://www.Ofwat.gov.uk/aboutOfwat/structure/gud_pro_100616rulesofprocedure.pdf)
[550] Link to past Board Minutes: (http://www.Ofwat.gov.uk/aboutOfwat/structure/boardmeetings/)
[551] The Duties of OFWAT are comprehensively listed in the Water Industry Act 1991 as amended by the Water Act 2003.

the regulatory power to impose fines on providers or take other legal action. In addition to this it sets caps on prices through a five yearly review process. It also has a duty to protect the interests of customers by promoting competition, to ensure that the companies (who are also under legal duties to provide access to safe drinking water to non domestic customers) fulfil their duties and can financially carry out any expected provision, maintenance or needed improvements.

The Price Mechanism RPI + K

(Not Deregulation but Re-Regulation)

The form of mechanism used to control the Water Industry was devised by the economist Stephen Littlechild initially for the telecommunication sector and has since been applied to a variety of privatised British Utilities[552]. The regulation adjusts the prices of the individual private operators. In adjusting (or having the power to adjust as the adjustment is optional) the price it considers various factors.

[552] Littlechild S "*Economic Regulation of Privatised Water Authorities and some further reflections*" Oxford Review of Economic Policy 4 (2), (40-68)

RPI + K is the formula used to summarise the adjustment mechanism. RPI stands for the Retail Price Index, but refers to the change in the Retail Price Index and therefore the increase in the cost of goods and services. The Retail Price Index is a measurement, which monitors inflation and is governed by the Office for National Statistics[553] which is the Executive Office of the UK Statistics Authority[554]. K is the variable used in the adjustment of the rate by which each operator can increase the charges in addition to the inflationary rise, which is defined as stated by the Office for National Statistics in the Retail Price Index.

The Regulator (Ofwat) effectively determines a cap on the price that each operator can charge. Every five years there is a 'Periodic Review Process' by Ofwat. It calculates a valid cap by collecting information about each firm's expenditure, performance and required investment. The cap should allow each company to profit from its revenue stream and finance all of the operations including investment and maintenance to provide an adequate service to all of its customers. Although the review is every five years there can be interim adjustments of the K factor, which can be sought by the companies or altered by Ofwat. In addition there can be if needed what are

[553] http://www.ons.gov.uk/about/index.html
[554] http://www.statistics.gov.uk/hub/index.html

termed as Interim[555] or Substantial[556] Determinations which provides Ofwat the ability to alter their caps if necessary. Most companies apply and are provided with Interim Determinations, which are essentially annual reviews within the five year review which may and often do allow the prices to be altered which are discussed at length later in the Thesis .

Essentially the five year caps are determined by calculating the revenue necessary for the private provider to finance both ongoing costs relating to service provision , capital expenditure costs , paying taxation and rewarding investors through the provision of profit in the company. "*The annual percentage difference between the revenue requirement and the base year revenue expected from customers is the price limit*." [557]

In all economic systems there are financial risks to consider. In this system there are three parties, the government, the private provider and the consumer (collectively society). The consumers bear the risk of inflation between review process cycles. The private operators bear the risk (in

[555] OFWAT:
(http://www.Ofwat.gov.uk/pricereview/setting/interim)
[556] OFWAT:
(http://www.Ofwat.gov.uk/pricereview/setting/substantial)
[557] For more information see OFWAT Webpage:
(http://www.Ofwat.gov.uk/pricereview/setting/)

addition to market forces and the unforeseen costs of operating any commercial organisation) of restriction, which the K value brings.[558] The Government may be perceived to carry little pecuniary risk, however it should be noted that if one of the private providers were to fail in either provision or in operation, or indeed all private providers were unable to operate then the government would have to provide the water and remedy any problems caused by the network collapse.

The motivation for the private operator to increase their efficiency is derived from the factor that their profits will increase as their costs fall through more efficient provision; this profit will be acceptable if it is within the cap set by Ofwat. There is an individual motive to increase efficiency and therefore profits as Ofwat also monitors efficiency of the individual private operators in comparison to the efficiency of the other private operators. This cross-utility efficiency is monitored using a variety of factors and importantly has an impact on what Ofwat sets as the operator's price cap, for example if one operator X is more efficient than operator Y, then operator Y's price cap

[558] The World Bank, (Public-Private Infrastructure Advisory Facility) "*Approaches to Private Participation*" The International Bank for Reconstruction and Development / The World Bank, 2006

may be restricted below the preferred amount as an incentive to increase its efficiency to a level that has been demonstrated by company X.[559]

The market system is distorted by regulation, there is not an open system where the market is only controlled by the elements of movements in the economy, but by the Government through regulation. Thus an exit from complete national control brought privatisation, which was accompanied not by de-regulation but a re-regulation.[560]

The scrutiny of Ofwat monitoring the providers has increased over the years. This was due to the high levels of corporate profits and the divergence between the expected rates of return and the actual rates of return. The water price also increased with privatisation and this combined with the growing corporate profits placed political pressure on the Government and then in turn the Regulator to control profits and prices resulting in increased scrutiny.

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[559] Bakker K "*From Public to Private to Mutual? Restructuring Water Supply Governance in England and Wales"* Geoforum 34 (359-374) (2003)
[560] Maloney W and Richardson J "*Water Policy Making in England and Wales: Policy Communities Under Pressure?*" Environmental Politics, 3 (4) Pages (110-138) 1994

Dispute over Price Determination

It is very uncommon for companies to question Ofwat in relation to the price determination. If however they seek to challenge Ofwat this can be done with an effective appeal to the Competition Commission[561], which is completely independent of Ofwat. At the last (five year) price review only one company decided to refer their price cap to the Competition Commission who accordingly saw fit to alter the price determined by Ofwat (See Bristol Water).[562]

Industry Respect

As can be seen from the multiple executive representatives interviewed for this work the commercial providers have a great deal of respect for Ofwat and the quality of their decisions and work.

"*At the highest level Ofwat do a very good job. Their duties placed on them*

[561] The Competition Comission: (http://www.competition-commission.org.uk/)
[562] Competition Commission Report on Bristol Water plc, The Competition Commission, August 2010: (http://www.competition-commission.org.uk/assets/competitioncommission/docs/pdf/non-inquiry/rep_pub/reports/2010/fulltext/558_final_report)

by the law work well to provide a stable environment for the sector to operate within and they protect consumers from the excesses of an unregulated monopoly.

There is always opportunity from enhancement.

Ofwat are fit for purpose and the most important thing from an investor's point of view is stability and transparency, that is what you get in our water sector.

If you look at Moody's the credit rating agency the water sector from a regulatory point of view is AAA, the top rating."[563]

As can be seen in Appendix 1 all of the corporate providers were generally pleased with the strict regulation of Ofwat and although it prevents a completely free market it allows sustainable water provision.

[563] Mark Holloway of Thames Water, Interview, See Appendix 1.

The Process of Price Setting

The process of review aims to consider the needs of the three main stakeholders; the country and the water infrastructure (maintenance and construction), the companies and their ability to make a profit, the environment and the customer.[564] The way in which prices are set are comprehensively and openly published and recognise the ongoing costs related to the industry such as maintenance and leakage prevention to newly associated future costs such as the promotion and funding of sustainable and environmental development.[565] Each provider is compelled to provide detailed plans of their future intentions and expenses.

Interim Determinations

In the periods between the five yearly price reviews companies have the ability to request what is termed an interim determination. The interim determination is essentially a way in which companies have to request an

[564] "Involving Customers in price setting: Ofwat, 2011: (http://www.Ofwat.gov.uk/future/monopolies/fpl/customer/pap_pos20110811custengage.pdf)
[565] "Setting Price Limits For 2010-15 (Framework and Approach): (http://www.Ofwat.gov.uk/pricereview/pap_pos_pr09method080327.pdf)

alteration in the price limits, within the five year price periods. The companies would have to prove that this alteration was valid. Ofwat also has the power to lower price limits but it must show that an alteration in the determination complied with criteria of materiality. This essentially observes whether there has been an increase (or decrease) in the costs of a company which equate to 10% of its turnover. If for example the costs of a company increased above 10% of their turnover and an application for an interim determination was made then this determination would be deemed to be material (as opposed to trivial) and the price limits would (at the discretion of Ofwat) be adjusted accordingly.[566] The next review will take place on 2014 and will consider among other things various reviews in the price determinations.[567]

Non Domestic Prices

One major change will be that England will follow Scotland in allowing non domestic customers the ability to choose their water supplier. The prices which non domestic customers will be subject to will also continue to be

[566] Interim Determinations (OFWAT Webpage): (http://www.Ofwat.gov.uk/pricereview/setting/interim)
[567] The reviews including; The Pitt review of the 2007 floods, The Cave Review on competition and the Water Markets, The Walker Review on Household Charging and The Gray Review on OFWAT and the Consumer Council for Water. (Discussed Later)

capped by Ofwat who determine the caps in a similar manner to the domestic caps.[568] Here England is following the lead of the Scottish example which has for many years operated, on a basis of incorporating non domestic competition across the country. Until legislation has been passed non domestic choice is not an option but it is the Government's intention to alter this.[569]

Benchmarking and Future Reviews

Performance benchmarking is now standard practice in England and Wales. Here Ofwat collects and publishes a set of indicators which compare private contractors. This effective scorecard is valuable for several reasons, primarily it allows the regulator to monitor the providers, it also allows the public to view the development (or lack of development) and efficiency of their regional company in comparison to other regions. Benchmarking also enables the utility companies to compare their results not only with previous years but also with different providers. This is just one consideration which Ofwat has when measuring and ascertaining the correct price settings. The

[568] "Future Price Limits, What does it mean for non-household customers?" OFWAT, May 2012: (http://www.Ofwat.gov.uk/future/monopolies/fpl/prs_lft201206fplnonhousehold.pdf)
[569] At time of review (November 2012) this has not yet been passed as legislation.

next review will take place in 2014 and will consider among other things various review determinations.[570]

Concessions

The Concessions for provision of water and sewerage in England and Wales are currently set at 25 years. Such time is considered long enough for a company to prove its success and spread the large infrastructural costs over a long period. *"The type of contact for PSP (Private Sector Participation) has a clear impact on transaction costs: the more specific the required investments, the longer the duration and the more comprehensive the task, the higher the additional costs."*[571]

The Concession usually has very high transaction costs and is preceded by legislation, which is necessary and intricately governs the powers and responsibilities of both the state and the provider. The English and Welsh systems have avoided constant change in regional provision as the term of

[570] The reviews including; The Pitt review of the 2007 floods, The Cave Review on competition and the Water Markets, The Walker Review on Household Charging and The Gray Review on OFWAT and the Consumer Council for Water. (Discussed Later)
[571] Rothenberger D and Truffer B "*Private-sector participation in water and sanitation reviewed*" in Chenoweth J and Bird J "*The Business of Water and Sustainable Development*" Greenleaf Publishing, 2005

contracts are not only lengthy but the time in which a contractor is given notice is also considerable. This not only provides the contractor with a sense of economic security which allows them to plan for future financial and industrial developments but it prevents constant change in the provider and with it the costs associated with the tendering process. In having a system of stable provision the corporate uncertainty and tendering expense in time and money for both the state and the providers is circumvented.

"*One of the most crucial issues in PSP settings is how to achieve more symmetric information. Here, a strong regulator with competence in defining information requirements and processing obtained data plays a key role…Even in a developed country, such as France, the lack of an effective regulatory body to monitor PSP contracts can lead to severe problems. In 1995, then CEO of Suez, Philippe Brongniart pointed out that the elected public bodies were not able to fully comprehend the complicated long-term lease and concession contracts*." [572]

[572] Rothenberger D and Truffer B "*Private-sector participation in water and sanitation reviewed*" in Chenoweth J and Bird J "*The Business of Water and Sustainable Development*" Greenleaf Publishing, 2005

Without expanding upon the reasons why various other developed and wealthy countries have not sustained as successful a private provision as England and Wales, Rothenberger in the above article makes it clear that the regulatory body must hold competencies in not only management but full comprehension of the governance of the system. The regulatory body must be fully and comprehensively aware of the laws, which bind it and must have the ability to adapt to future changes in that system.

The professionalism of the system is paramount. OFWAT is not governed by elected officials but is organised and managed like a corporation, where individuals are hired for their expert knowledge and ability. If a regulatory body is to be successful the way in which that body is managed is of paramount importance. It must employ professionals who are capable and politically independent in their decision making.

Transfer of the Concession

Welsh Water was the only one of the main providers to have changed from a Private Limited Company to another form of ownership due to operational

difficulties[573]. It transferred to a Company Limited by Guarantee, which distributes any financial surplus through improving the service to customers.[574] The previous Welsh Water was purchased along with its supply rights and responsibilities by a company called Western Power Distribution which in turn sold Welsh Water to Glas Cymru. This was a sale of ownership from one company limited by shares to another and then a sale to a company limited by guarantee[575]. As yet no company has been legally forced to halt provision and as the time limit has not yet lapsed for any concession the process of tendering and transfer is yet untested. If there was a forced transfer from one provider to another, issues such as fair remuneration would be bound to arise and the process of redress if one party was disgruntled, would also need to be clarified. As yet these hypothetical issues have no distinct answer but shall no doubt be answered in time

[573] Discussed at length in Part 3 of Chapter 6
[574] Glas Cymru (Welsh Water): (http://www.dwrcymru.com/en/Company-Information/Glas-Cymru.aspx)
[575] Welsh Water is discussed at length separately in the Thesis.

Resulting Corporate Diversification and Bargaining

Corporate Diversification.

The ten English and Welsh Water authorities are substantial organisations with financial resources and various possibilities related to diversification. It is unusual for such large corporations to only focus on the core of their business, but this has happened almost exclusively for the water industry.

In today's small financial world it is common for large corporations to have a core and expand from that core to incorporate not only related businesses, but businesses which have no relation to their core area of expertise, this is termed unrelated diversification. Banking for example is an industry which is now famous (or infamous) for diversifying out with the core business of private banking to incorporate a variety of economic interests including the large scale purchase of art and modern art and in merging investment banking with personal banking.

The reluctance of the companies to diversify may be one of the reasons why they have provided a generally good service. It should however be noted that

these companies are bound by law to provide a service of quality, but they are not bound to only operate in one sector. This sector focus has evolved voluntarily through the inspiration and business acumen of the individual corporations. Where they have diversified it has been mainly in businesses, which directly relates to their existing core (water services and waste management).

"*In the first five years since privatisation the 10 water plcs have acquired 109 companies and engaged in 60 joint ventures. Of this total, 45% have been in water services or waste management, while a further 54% were in associated fields such as contracting equipment and technology, consultancy and engineering and utility services.*"[576]

Coherent corporate diversification, where a business expands in its core and related areas has been advocated as the most stable and successful way to expand and also to operate a large scale business structure. If a corporation is to offer a variety of services and product then to have continuity and similarity in those products enables a company to specialise in one area and

[576] Ogden S and Glaister K "*The Cautious Monopolists-Strategies of Britain's Privatized Water Companies*" Water Companies Long Range Planning 29, 5, (663-674) 1996

expand within the boundaries of that area, in doing so they should be able to grow and maintain focus.[577]

The water companies have legally been allowed to operate within a free market, sharing the other rights that other corporations hold to expand and diversify, but wisely they have not exceeded responsible diversification and growth. One of the biggest purchases was when in 1990 Severn Trent purchased Biffa Waste for £212 Million, which made Severn Trent one of the largest waste management companies in the UK. There has also been diversification not from practice but in location with several firms now operating abroad including Thames and North West. In 1993 North West succeeded in obtaining the tender (worth £11 million) to provide Melbourne with a water treatment plant. It also obtained the right to complete an 18 year contract (worth £1.25 billion) in Malaysia to upgrade and extend sewage works.[578]

Many businesses have perished through expanding too quickly and diversifying into areas which they have no expertise, indeed this will be

[577] Teece D et al, "*Understanding Corporate Coherance*" Journal of Economic Behaviour and Organisation 23 (1-30) 1994
[578] Teece D et al, "*Understanding Corporate Coherance*" Journal of Economic Behaviour and Organisation 23 (1-30) 1994

discussed later as it is pertinent when assessing the demise of (the original) Welsh Water. The water industry in England has not made this mistake, nor has Welsh Water in its current corporate form.

Bargaining

The change in ownership had various significant impacts on governance. One of the most important of these was the change from a system of Industry Bargaining to that of Single Employer Bargaining. In Industry Bargaining issues are covered at a national industry level and are not separated into individual categories or points of debate for individual corporations. Single Employer Bargaining is self explanatory, in that the Union bargains with a single employer as opposed to a national unit.

From a liberal commercial perspective Single Employer Bargaining enabled corporations to deal with issues that would have an impact on their business outlook and the needs of their employees as opposed to compromising with a National Union's objectives. From an administrative level it reduces the bureaucracy of multi-level, multi-party negotiations.

It was not the case that the Government was pushing this move to enable the newly formed businesses to successfully complete annual targets. Some water authorities were also in favour (before privatisation) of Single Employer Bargaining, Thames in 1986 left national bargaining and in early 1988 Northumbria also departed from National Bargaining. By the middle of 1988 most of the water authorities realised that Single Employer Bargaining was now the logical method of negotiation.[579]

There was also a need to emphasise the change of governance between public provision and private provision. The way in which National Bargaining operated epitomised how the public sector utility operated. Corporations were eager to lacerate the perception of the old national utility, governed by public sector methods and develop new privatised systems of governance.[580]

Change was facilitated through the new legislation, which enabled new governance as described above. In some instances to have a central authority to advocate and defend the interests of employees is beneficial, for example

[579] Ogden S "*The Reconstruction of Industrial Relations in the Privatised Water Industry*" British Journal of Industrial Relations Volume 32 March 1994
[580] Ogden S "Decline and Fall: National Bargaining in British Water" Industrial Relations Journal, 24 (44-58) 1993

when there are no regional variations in municipal needs. The division of the national utility into separate private entities each with uniquely individual concerns resulting in Single Employer Bargaining being a logical and necessary step toward both fulfilling the needs of the private sector and the demands of the industry and its workers.

In addition to understanding the regulatory and legal framework for a comprehensive and holistic analysis of water provision there must be a detailed review of both private systems both in Wales and England.

Part 2

England

Introduction

(Provider Summary of Provision)

"*The benefits to the industry of moving to private sector ownership can be summed up in various ways. Here are three:*

One -Benefits to Customers. The industry has been able to deliver benefits to its customers and society through big improvements in service, reliability and the health of the environment while keeping prices at reasonable levels.

Two -Access to Capital. Previously denied access to the capital markets has made possible much higher investment in assets and service standards (annual investment routinely double that under public ownership) and allowed us to deliver badly needed improvements and grow in confidence that we are making a major contribution to economic, social and environmental sustainability.

Three -Higher Productivity. Private sector business methods have led to higher productivity and an increasingly skilled workforce. This, together with access to the markets, has made possible a doubling of investment without equivalent price increases."[581]

Such statements cannot be taken in isolation but must be triangulated with facts to ascertain if the statements are valid. There is obvious self interest in the corporate providers promoting their worth, but their comments, like many opposed to privatisation are subject to bias. The important factor is to analyse the statistics in conjunction with what is being said as the statistics are provided to the independent regulators and are independently verified. The analysis focuses on the key areas of effective provision, most of which have clear statistical information which has been referred to below.

Defining and Analysing Effective Provision and its Critical Factors of Success through Key Performance Criteria.

If the private provision of water is to be assessed, the pertinent question should rationally be 'has it been effective' or indeed has the private

[581] Interview with Geoff Loader, Southern Water Limited, See Appendix 1

provision been more effective than public? Before this question can be answered effectiveness must be defined and that definition validated.

For a comprehensive assessment, a system's component parts need to be critically scrutinised and the National and International targets assessed and their worth evaluated. One of the most challenging areas of analysis is determining how the adequacy of provision should best be assessed and monitored. This can be done through Key Performance Criteria.

Key Performance Criteria are defined, described and utilised as a tool to monitor the progress or decline of the private system in England and Wales and are divided into six component parts.

This provision will be assessed not to a fixed benchmark of 'success' or 'failure', but will determine if each part and the sum of those parts can be seen to be as close to effective provision as possible. This analysis will incorporate the concepts of Sustainable Development, which will enable there to be constantly evolving targets of Sustainable Provision.

Sustainable Provision is the ultimate provision of water and in practice a

continually moving target towards which providers, regulators and legislators strive to achieve through Sustainable Development. An example of a Key Performance Criteria would be price and the indicator would be the affordability of that price. The provision of water at an affordable price alone should not imply effective provision, nor should an industry define its progress on one factor in isolation. It is the case however that price plays an important part in the effective and sustainable provision of the service and a stable and affordable price combined with a variety of factors would bring production closer towards effective provision. It may be that an industry is progressing towards effective provision in relation to price, but is providing a poor quality of water.

The totality of provision must be encompassed and in doing so embrace the ever changing nature of the industry which demands a new mode of assessment, a holistic and sustainable view of the process and the variety of elements from which it is composed. Effective provision is a journey, which involves sustainable development and is not only a destination.

The Key Performance Indicators are broken down into the following headings:

Access

Quality

Price

Economic

Environment

Sustainability is discussed in the following Chapter.

Access

Access is critical to evaluate the effective nature of provision if there is no or limited access then there can not be a system which is effective. Access should be available to all in any part of the country.

The United Nations perceives England and Wales (and indeed all components of the United Kingdom) to have a 100% rating for access to drinking water and sewerage coverage.[582] There is a statutory duty of

[582] The Pacific Institute. World Water Statistics:

provision imposed upon the providers when requested to provide water and sewage treatment. Across England ,Wales and Scotland access is not deemed an issue. It was the case however that access was once restricted if there was non-payment, this was in the form of customer disconnects.

Customer Disconnects

After privatisation there was an increase in disconnects for those who did not pay. An uncompromising payment policy increased payment compliance, revenues and profits. Not surprisingly the disconnects tripled in the first five years of privatisation. The industry was barraged with heavy criticism but reposted by stating that they were only disconnecting those who were not willing, not unable to pay[583]. The providers came under media and political pressure to stop this from happening. As a response to the unpopularity of the water cut off's some water companies installed a pre pay water card meter, which would effectively cut the water off if there was no payment. In 1998 New Labour led by the then Prime Minister Tony Blair[584]

(http://www.worldwater.org/data20062007/Table3.pdf)

[583] Dore M, Kushner J, Zumer K, "*Privatisation of Water in the UK and France, What Can we learn?"* Utilities Policy 12 (2004) 41 - 50

[584] The Right Honourable Mr Tony Blair was in office as Prime Minister from May, 2 , 1997 – 27 June 2007.

passed the 1998 Water Act. This Act stated that it was illegal to cut off domestic water use. In addition to this the Act made the use of the aforementioned pre paid water meters illegal. Currently it is still illegal for any domestic user to have their water stopped by a company for non payment of sums due. Non domestic customers including shops and offices will have their water disconnected if there is no payment. Interestingly there is no legislation which prevents the disconnection for non payment for other services to domestic customers which can be deemed as essential such as electricity.

Quality

Just as important as access is drinking water quality as if the water provided carries disease or any chemicals it could result in a fatal illness. The quality of the water is just as important as access to it and poor quality of provision would provide a service which is not effective.

Drinking Water Quality

Before privatisation drinking water was provided by a system, which was rapidly deteriorating and was not fit for purpose. Between 1990 and 2010 £38.5 billion was spent by private companies to improve drinking water quality.[585]In total around £100 Billion has been invested by the water companies. [586] Since Privatisation 25% of the entire drinking water distribution network has been replaced (33,902 km) and rehabilitated (50,839 km), which is enough to go more than twice round the globe. Between 1990 and 2000 over £ 9.2 billion was invested in the sewerage service in England and Wales. A large proportion of the £5.3 billion spent between 2000 and 2005 on the sewerage service to improve treatment standards, storm overflows, and sludge disposal.[587] The result of this massive increase in spending in network distribution and treatment has been an improvement of water quality.

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[585] "Drinking Water Quality In The UK" Progress Report, Water UK, 2010 (http://www.water.org.uk/home/policy/publications/archive/drinking-water/dw-quality-progress/20yr-dwq-report-final.pdf)

[586] Since Privatisation to 2012 over 85 Billion Sterling has been invested by private water companies into the water provision service – it is estimated (August2013) This is now around 100 Billion : (https://www.Ofwat.gov.uk/mediacentre/fastfacts/prs_web_timeline.pdf)

[587] "Sewage Treatment in the UK" Department For The Environment Food And Rural Affairs, 2002. (http://www.DEFRA.gov.uk/publications/files/pb6655-uk-sewage-treatment-020424.pdf)

The Drinking Water quality has improved continuously and markedly since privatisation. It is rigorously monitored not only at a local level by the providers but by the DWI (Drinking Water Inspectorate). Now less than 0.3 % of water tested fails standards.[588]

Drinking water tests are comprised of 39 parameters[589] which fulfil not only National but European Union Specifications. The parameters include microbiological, physical and chemical test elements. Although there are slight regional variations on a country wide level the quality of provision is excellent and admirably meets European Standards.

"*Compliance with the EU Drinking Water Directive for England and Wales combined was the same as the previous year at 99.96% with only 0.04% of 1.9 million tests failing to meet one of the chemical or microbiological standards….In 2011, out of 43,000 tests on samples collected from public buildings just 35 tests failed to meet a standard or an indicator parameter*

[588] Department for Environment Food and Rural Affairs: (http://www.DEFRA.gov.uk/statistics/environment/inland-water/iwfg14-drq/)
[589] Including testing for substances such as Ecoli and lead.

value."[590] It should be noted that this is a stark improvement from 76% compliance in 1989 before privatisation[591].

Privatisation has brought massive investment to the improvement of the water provision and sewage treatment infrastructure resulting in a dramatic and continuous improvement in the quality of the water provided.

Service quality is also monitored by Ofwat which takes into account a variety of factors when ascertaining the quality of service provision. Every company's customer service score is derived from the number of customer enquiries and complaints they receive ('customer contacts') and how satisfied customers were with the way the company dealt with them. In 2011-2012 the average mark for Customer Service was marked at 75%.

In 2011- 2012 there were around 22,000 written complaints which was the lowest number of complaints in four years. These are in turn monitored by Ofwat:

[590] Letter by the Drinking Water Inspectorate to Richard Benyon MP, Parliamentary Under Secretary for the Natural Environment and Fisheries, 26 June 2012 (http://dwi.DEFRA.gov.uk/about/annual-report/2011/letter-england.pdf)
[591] http://www.Ofwat.gov.uk/publications/focusreports/prs_inf_pricelimits.pdf

"*Customer satisfaction with the overall manner in which the companies handled their concerns was high. We asked 16,000 customers to give us their view of how well their company did on a scale of 1 to 5 (where 5 indicates they were 'very satisfied'). The average result for all the companies in 2011-12 was 4.34.*"[592]

Customer Price in England and Wales

One of the main concerns as highlighted in the current literature in Chapter 2 was the affordability of water. There must be access to water of a good quality and that water must be affordable and that price must be monitored for the provision to be effective.

Bills in England and Wales may vary from year to year depending on whether the price is fixed or metered, which provider bills and if there is an application for Interim Determination. The variations depend on the amount the provider needs for infrastructural development, maintenance, advancement and environmental changes such as drought and pollution control. These prices are however monitored at all times by Ofwat.

[592] OFWAT Webpage: (http://www.Ofwat.gov.uk/regulating/reporting/rpt_los2012customer)

All customers domestic, professional and industrial must pay the private companies for the provision and service of their water, if provided. It should be noted however that a domestic customer cannot be disconnected even if their bill is not paid.[593] Other legal action may be taken, but the companies are restricted from removing the water supply.

Since privatisation the policy of 'economic equity' has been introduced, which essentially means that the user of the utility should pay as close as possible to the cost, which they actually are the cause of. Ofwat under the Water Industry Act 1999 (Section 2.3.a.ii) is obliged to ensure that there is no undue discrimination in the setting of charges. This essentially prohibits for example the provision of the same product to different customers (domestic as opposed to industrial) at different rates.

The EU places its members under strict obligations to ensure that for example bathing water is at an acceptable standard. England once had extremely polluted coastlines and a large part of the cost of cleaning the coastline has been paid for by the privately owned water suppliers. The

[593] Discussed at length later in the Thesis

pecuniary burden in having to pay for such large operations was and is great and it has and does greatly have an effect on regional price variations. The average domestic bill for South West (a polluted costal region) in 1999-2000 was £390 per year as opposed to the industry average at £277 and the lowest regional charge (Thames) at £208. It should also be noted that within a region a water company may charge different rates. The main three reasons why drinking water has increased in price at a national, regional and sub regional level is; an increase in investment and maintenance at a *structural* level, an increase in the level of drinking water quality and environmental issues including pollution reduction and the ablution of waste.[594]

It is true that privatisation and an increase in domestic water did occur simultaneously. It should be remembered that the price eventually set is approved by Ofwat and that there was huge investment in infrastructure, which happened at a large cost to the water companies. South West Water's annual charge almost quadrupled between 1988-9 and 1999-2000 from £100 to just under £400 (£390).

[594] Bakker K "*Paying for Water: Water Pricing and Equity in England and Wales*" Transaction of the Institute of British Geographers, Vol 26, No 2 (2001)

During the 1990s where profits of the private providers rose significantly and the response was that Ofwat started to state that water companies prices should reduce. They stated that this would return efficiency gains to shareholders and return the water price to that which was politically and economically acceptable. Limits were duly imposed in 1999 and bills were reduced the following year by around 12.4%.[595]

Ofwat estimates that due to the private sector driving out inefficiencies the average bill is around £110 lower than they would have otherwise have been had the same improvements and spending been made by Government.[596] This is obviously an estimation, but it is an estimation by the independent regulator and should be given credit.

Ofwat last had its five year review in 2009[597] and determined the price limits for the period 2010 – 2015 within a complex and structured framework.[598] The average household bills now stands at £376 for the year 2012/13. This has been an increase from £236 in 1989/90 when there was the transition to

[595] Bakker K "*From Public to Private to Mutual? Restructuring Water Supply Governance in England and Wales"* Geoforum 34 (359-374) (2003)
[596] http://www.Ofwat.gov.uk/publications/focusreports/prs_inf_pricelimits.pdf
[597] OFWAT:
(http://www.Ofwat.gov.uk/pricereview/pr09faqs/)
[598]Setting Price Limits For 2010-15: Framework and Approach
(http://www.Ofwat.gov.uk/pricereview/pap_pos_pr09method080327.pdf)

privatisation. In the past twelve years there has been an increase of £51 from £325 to £376. Since 1989/90 the increase (to 2012) has been £140[599] . It should be noted that considering the increase of other goods the price of £236 in 1989 would equate to (incorporating inflation) £497.96 in current prices.[600]

The increase in price is defended by Ofwat as necessary to provide a high quality of drinking water and also to aid the continued environmental improvement in the quality of water in the beaches and rivers across the country and highlights that ; "*By 2015, companies will have spent on average £935 for every property in England and Wales on services improvements, including on cleaning up rivers and beaches*".[601]

Table 7

[599] OFWAT "Changes in Average Household Bills Since Privatisation"; (http://www.Ofwat.gov.uk/pricereview/pr09faqs/prs_faq_prcltssinceprivat)
[600] Inflation Calculator: (http://www.thisismoney.co.uk/money/bills/article-1633409/Historic-inflation-calculator-value-money-changed-1900.html)
[601] Water Bills in England and Wales to Rise 5.7% in April, BBC News, 31 January (http://www.bbc.co.uk/news/business-16801585)

Average Household Bills 2012/13 – Water and Sewage Providers[602]:

Water and Sewage Company	Average Bill (Pounds Sterling)	Increase as a percentage from previous year (From April 2012)
Anglican	£423	5.4%
Dwr Cymru (Welsh Water)	£427	3.8%
Northumbrian (Not Essex and Suffolk)	£352	5.1%
Severn Trent	£325	5%
South West	£543	4.7%
Southern	£416	8.2%
Thames	£339	6.7%
United Utilities	£395	4.7%
Wessex	£455	6%
Yorkshire	£361	6.1%

[602] OFWAT: (http://www.Ofwat.gov.uk/regulating/charges/prs_web_charges2012-13)

Price Comparisons

The rate at which England has in real terms increased its price of provision in European terms has been cheaper than many European counterparts including: Hungary, France, Denmark, Germany, the Netherlands and more.[603]

The cost[604] in London (2008) in US Dollars per cubic meter of water was $3.57 compared with:

Copenhagen $8.69

Berlin $7.00

Brussels $4.61

Paris $4.08

In America in (2009/10) the average household spent $474 (£296) on water and sewage with an additional $230 (£144) on water used for heating.[605]

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[603] European Environment Agency: (http://www.eea.europa.eu/data-and-maps/indicators/water-prices)

[604] "Global Water Prices Rise by 6.7%" Global Water Intelligence, Volume 9, Issue 9 September 2008: (http://www.globalwaterintel.com/archive/9/9/analysis/world-water-prices-rise-by-67.html)

Between 2010 and 2012 water prices increased for a single family residence by 17.9 %.[606]

In Scotland, Scottish Water the nationalised authority is in complete control of domestic provision. In England where the water is privatised one would be incorrect to think that there has always been universally more expensive provision. Per 100 gallons, based on roughly 4,000 gallons a month usage the price of water in Glasgow was $2.50 compared to Newcastle, which is privately provided at $1.46. [607] It is the case however with the increases Scottish Water with an average bill of £324 ($515) will now be below the average English and Welsh water bill.[608] One should note two things however, firstly as stated Scotland receives an annual loan of millions of pounds (£140) by the Government, which the English private providers do not and secondly the cleansing of the water in Scotland is less intensive. Glasgow which is Scotland's largest and most industrial city is for example

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[605] "Water on Tap, what you need to know" EPA Office of Water, 2009: (http://www.epa.gov/safewater/wot/pdfs/book_waterontap_full.pdf)
[606] Walton, B "The Price of Water 2012" Circle of Blue, 10 May 2012: (http://www.circleofblue.org/waternews/2012/world/the-price-of-water-2012-18-percent-rise-since-2010-7-percent-over-last-year-in-30-major-u-s-cities/)
[607] "*Water Our Thirsty World*" National Geographic Special Edition, April 2010
[608] Scottish Water: (http://www.scottishwater.co.uk/you-and-your-home/your-charges/2012-2013-charges)

supplied wholly by Loch Katrine, from collection to distribution the process of provision is almost direct, bar filtration and disinfection.

Metering

Metering is being widely introduced across all regions and is supported by Ofwat not only because it reduces the use of unnecessary withdrawal, but it informs the customer of exactly how much is due. Metering is also more comprehensive to the customer as they can detail how much they spend and they know when and why it is being spent.

Metering can reduce many household's bills, however it can also increase many households. To ensure that some consumers, for example a single parent with multiple children, do not suffer due to metering the government introduced an option where if a household wishes they can opt to pay the average household charge as opposed to having a metered service. [609]

"*The evolution of water charging policies in England and Wales over the past three decades has been underpinned by a shift in the prioritization of*

[609] Bakker K "*Paying for Water: Water Pricing and Equity in England and Wales*" Transaction of the Institute of British Geographers, Vol 26, No 2 (2001)

equity from social towards economic equity and from the ability to pay principle towards the benefit principle. Given the incomplete application of policies of equalization, and the incomplete penetration of metering and application of marginal cost pricing, neither principle of equity has been fully applied in practice. The current consensus that universal metering is theoretically desirable but impractical and expensive – implies that temporal and spatial cross – subsidies will continue in the water sector."[610]

Economic

Was Privatisation needed?

In analysing the economic elements several matters must be considered such as the economic viability and profitability of the providers to both run a profitable business and provide the service demanded by National and European Legislation. Before this several economic questions must be answered such as was privatisation needed economically and since privatisation have there been financial savings and gains.

[610] Bakker K "*Paying for Water: Water Pricing and Equity in England and Wales*" Transaction of the Institute of British Geographers, Vol 26, No 2 (2001)

For decades before privatisation the water infrastructure had lacked needed investment and maintenance. The administration before privatisation (Labour) had cut the capital expenditure on the water industry by 29%[611]. The decay however was the fault of a series of different administrations. With each passing day before privatisation the system was decaying and the cost of restoration was increasing beyond the means of the State. In addition to the outgoing annual maintenance costs , incoming revenue which could be gained from taxation and the sale price were important financial factors.

"The single most important benefit that privatisation has brought to the industry is the ability to utilise private sources of finance to meet substantial funding requirements. By the end of 2012 the industry will have invested over £100 Billion in improvements since privatisation, meeting formidable quality and environmental challenges. Privatisation was driven by the realization that public funding of these improvements would be unlikely to be either viable or efficient and that the required improvement in standards would not be affordable based on increases in customer bills alone. Private finance has therefore acted as a bridge, ensuring that the benefits of

[611] Financial Times, Interview with Margaret Thatcher, November 1985: The Thatcher Institute:
(http://www.margaretthatcher.org/document/106171)

improvements can be enjoyed now, funded by small increases in customer bills over an extended timeframe." [612]

"*It [privatisation] happened because the public sector could not provide the capital needed. The water and the sewage sector were always at the bottom of the list of where money was to be spent by the government. The reason is happened was to get access to private funds. When it was privatised, there was an enormous injection of private capital, which has led to much better standards, much better customer service and significant improvements in efficiency. This is due to the financial model."*[613]

The Financial Savings.

No published work has to date estimated the financial saving to the economy since the privatisation of Water. Ofwat has not calculated the savings, which have been made since private ownership, as it is their duty to regulate not promote the efficiency of privatisation, they feel there is no obligation to do this. The following figures were calculated with the assistance of Ofwat[614]

[612] Interview with James Bulloch, United Utilities, See Appendix 1
[613] Interview with Colin Skellett, Wessex Water Services, See Appendix 1
[614] Particular thanks are extended to David Hackett and David Russell of OFWAT

and Water Asset Management[615]

Financial Factors

There are two sets of financial factors; firstly those which can be deduced or reasonably estimated and secondly, those which have an obvious impact to the economy, but cannot be reasonably estimated.

The four main areas where statistics have been collated and analysed are below:

Sale Price – The sale price which the government received (in total) from the private sector, in return for the utility assets.

Investment – The financial amount which was invested by private companies.

Borrowing – The financial amount, which would have been required to be borrowed by the Government to facilitate the needed regeneration of the water infrastructure.

Corporation Tax – paid by the newly founded companies

[615] Water Asset Management aided with the calculation and estimation of the gilt rates (borrowing) of the UK if privatisation had not occurred.

In addition to this there are two main areas, which have economic value but cannot reasonably be deduced, nor do any governmental bodies have information on them.

Income Tax – the income tax generated by private jobs has not been incorporated. If it were to be calculated (and subsequently incorporated) then the equivalent income tax would have to be estimated if the jobs were in the public sector. The private and public figures would then have to be deducted from one another to produce a net gain or loss to the State.

Contractor(s) – Since privatisation the use of contractors has dramatically increased. The amount of both Corporation Tax and Income tax, which these contractors inject into the economy will not be calculated nor incorporated. This will not be done for two reasons: Firstly the definition of contractors is not universal and varies from water provider to provider, for example Severn Trent includes any provider (even state employees such as postal workers) as a Contractor in their reports to Ofwat . Secondly, for a valid financial gain of the tax collected (in income and corporation tax) the figure presently

collected would have to be deducted from an estimate of what it would be if the utility was public for a valid net addition to be derived.

The Sale Price

The Thatcher Government sold its ownership in the water utilities of England and Wales in the 1990s, for approximately £5 billion[616]. The regulatory agency Ofwat was established to set returns, tariffs, and capital investment schedules. (In conjunction, two other regulatory agencies were also established: The Drinking Water Inspectorate, which sets and monitors drinking water standards and the Environment Agency which sets and monitors effluent standards.)

That initial £5 billion of income from the initial sale was not the main pecuniary gain, which has been the savings occurred by and since privatisation.

The privatisation of the UK water utilities has so far created additional

[616] Telephone conversation with OFWAT on November 2011 – David Hackett.

economic benefits to the UK government of approximately £80[617] - £150[618] billion during the last 20 years ($130 - $160 billion).

Investment Cost

The arithmetic is as follows: first, the Government avoided the burden of having to find over £94 billion[619] that was invested in restoring the infrastructure of the system.

[Note - Since 2011 (to 2012) the figure of investment which private companies have invested in the infrastructure is now quoted by Ofwat as £108 billion.[620]]

Borrowing Cost

Since privatisation over £94 billion has been invested in the water

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[617] 50 Billion (renewal / maintenance) + 25 Billion borrowing + 4 Billion in tax (Figures rounded)

[618] 94 Billion (renewal / maintenance) + 50 Billion + 4 Billion in tax

[619] Up to the end of 2011 OFWAT estimates that at least £94 million has been invested in the water industry since privatisation. As per David Hackett, OFWAT. This figure has also been stated as being 95 Billion by Regina Finn (in 2012) of OFWAT (Chief Executive)
BBC News 31 January 2012 – Interview:
(http://www.bbc.co.uk/news/business-16801585)

[620] OFWAT Webpage – Financials:
(http://www.Ofwat.gov.uk/regulating/reporting/rpt_los2012financial)

infrastructure. The interest cost on that capital investment, would have amounted to an additional £50 billion at an average 10 year gilt rate of approximately 6%[621].

Ofwat estimates that around £50 billion would have been raised through taxation. Hence this money would not come from the Government Treasury and the direct amount injected by the private sector, in isolation would be £44/45 billion. Even if this figure was halved, to only calculate the direct amount contributed by the private sector (and not the State), it would still amount to around £25 billion of borrowing[622].

Corporation Tax

From 2001 to 2011 the main water authorities[623] paid between £2 and £3 billion[624] in tax and it is estimated that £3 to £4 billion has been paid since privatisation. This figure was calculated for the first time as Ofwat had not

[621] 6% of 94 Billion x 20 (years) = circa 50 Billion
[622] 5% of 45 Billion x 20 years = circa 25 Billion
[623] The ten Water Authorities See Appendix 7 – Both Water and Sewage and Water Only are listed.
[624] £2.214 Billion paid and £0.774 Billion currently deferred – See Appendix 11

calculated it, nor was it in any other academic work and was determined with help from Ofwat.

It should be noted that the corporate tax paid by the Water industry are at the same rates as other British businesses. The rate for 2011 is 26% and for 2012 is 25%[625].

This number is taken from the official statistics held by and verified by Ofwat. Considering the how large these companies are the amount of revenue collected from corporate taxation may at first appear low and the disparity in payments high[626]. These figures must be considered with the fact that the providers have large capital allowances.

"*Companies are not allowed to use accounting depreciation[627] as a tax deduction. Instead they claim capital allowances[628], which effectively allows depreciation at Her Majesty's Revenue and Customs (HMRC) prescribed rates. The capital programmes are so large (companies are generally cash negative and must borrow annually) that the deductions calculated offset a*

[625] HMRC Webpage: (http://www.hmrc.gov.uk/rates/corp.htm)
[626] United Utilities for example paying almost twenty five percent of the corporation tax
[627] This is where as an asset depreciates it is used to offset tax.
[628] Spending on the infrastructure e.g. pipes.

large proportion of the taxable profit. Hence effective tax rates for the sector are low."[629]

This number does not include the tax paid by the numerous contractors who work for the providers.

This £80 - £150 billion of fiscal benefit to the UK is a substantial benefit to the British economy. (This includes the cost of borrowing as explained above)

(In addition from the 2009 Price Review Ofwat determined that the industry invest a further £22 billion. Sixty percent of which should be spent on maintenance and the remainder on enhancement.[630])

America's Future[631]

(A Brief Point on America)

[629] Russell, David from OFWAT. Taken from an email dated 15 November 2011.
[630] "Smoothing Investment Cycles in the Water Industry" HM Treasury Report July 2012: (http://www.hm-treasury.gov.uk/d/iuk_smoothing_investment_cycles_in_the_water_sector.pdf)
[631] Please read as an informative addition as apposed to an academic comparative analysis.

"*It is true that private industry is well positioned to unbundle the traditional services involved in the provision of water by applying financial capabilities with inherent economic incentives to concentrate on cost efficiencies. Private companies can design, finance, construct and operate water and wastewater facilities on a long term basis, thereby partially privatizing the activity. Potential benefits include reduced pressure on local governmental or municipal debt capacity, shorter design and construction periods, and reduced operational and compliance burdens for governmental units.*"[632]

"In the developed economies of North America, Western Europe and South East Asia, PSP (Private Sector Participation) is primarily utilised in order to shift the financial burden of upgrading and extending municipal water and sewerage services from central and local government to the private sector. This spending is driven mainly by demand for higher service quality, aesthetics (taste, colour and odour) and environmental considerations…The private sector has two real strengths: mobilising existing assets to optimise their efficiency and developing new assets so that they provide a given level of performance at the lowest price…Experience in the USA, England and

[632] Hoffman, Steve "*Planet Water, Investing in the World's most valuable resource*" John Wiley and Sons, 2009

Wales, and Germany since the 1900s has demonstrated that the privatisation of water and sewerage services can reduce capital spending by 20-45% and, through economies of scale and efficiency measures, service provision costs by 10-25%"[633]

The US is now facing similar problems that England and Wales were facing 20 years ago. It is currently suffering the cost of a crumbling infrastructure and a lack of potential future investment. According to the EPA, 30% of pipes in systems that deliver water to more than 100,000 people are between 40 and 80 years old. About 10% of pipes in those systems are older. On average there are 700 annual water mains breaks that occur each year. Each day leaking pipes account for an estimated 7 billion gallons of water according to the American Society of Civil Engineers. The EPA has estimated that the price tag for repairing the water infrastructure over the next 20 years is around $335 billion[634]. The American Water Works Association estimates that the spend needs to be around $1 trillion over the

[633] Owen, D "*The Private Sector and Service Extension"* in Chenoweth J and Bird J "*The Business of Water and Sustainable Development*" Greenleaf Publishing, 2005
[634] All Info from CNN - http://www.cnn.com/2011/US/01/20/water.main.infrastructure/index.html

next 25 years which if true could mean that water bills would accordingly double or triple.[635]

In England and Wales all 54 million users are served privately. In the US only around 15% (48,140,415) of individuals are served by the private sector with 13,060,519 connections. With under 2% being served by a Private/Public Partnership (5,243,620) and the remaining 83% being provided by the public sector, (264,500,094) with 81,722,491 connections[636].

If the water industry, were not to be sold and the total infrastructure was completely renovated, then the Government would presumably have to borrow $335 billion (taking the lower estimate as opposed to $1 trillion). If it were to be privatised, then the US Government could have a combined saving and return of between $270 Billion[637] and $500 Billion[638] over 20 years.

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[635] Ellis , B "*Water Bills Expected to Triple in Some Parts of the US*" CNN: (http://money.cnn.com/2012/02/27/pf/water_bills/index.htm)
[636] All info from EPA – Narrated over Phone – In Pivot Table http://water.epa.gov/scitech/datait/databases/drink/sdwisfed/howtoaccessdata.cfm
[637] $160 Billion + 80 Billion +$32 Billion
[638] $335 Billion + 150

The calculations are as follows: first, the government would avoid the burden of having to come up with over $335 billion that would have to be invested in restoring the infrastructure of the system.

Secondly, the interest cost on that capital, would have amounted to an additional $150 billion at an average 10 year gilt rate (of around half of $335 billion / $150 billion) of approximately 5%[639].

This would amount to $485 billion, $335 billion needing to be borrowed and $150 billion in borrowing.

Even if the number needed to restore the system was halved to calculate the direct amount contributed by the private sector (as opposed to hypothetical taxpayer payments to the government) this would still be a required government spend of $160 billion and a borrowing of $80 billion[640].

Thirdly, in England and Wales £4 billion ($6.4 billion) has been collected in corporate taxation in the 20 years since privatisation from the main

[639] 5% of 150 x 20 Years
[640] 5% of 80 Billion x 20 (years)

providers[641]. Conservatively estimating that the corporate tax from equivalent private sector growth would equate to five times that of England and Wales the amount in savings would be $32 billion. This figure does not account for the huge tax allowances that England and Wales afford their water companies. Nor does this figure include any external contractors who may be hired.

This would give a figure of around $270 - $500 billion in savings and revenue from taxation (over 20 years). This figure does not consider the amount at which the assets would be sold for, nor the additional amount that the private sector would spend over and above what the government would spend on the infrastructure.

Employment Reduction

It is true that privatisation streamlines the workforce of a business which in turn leads to the redundancy of staff deemed superfluous, or delegating the roles of necessary employees with fewer staff. (This is a concern of many of

[641] Water and Sewerage companies – independent water and sewerage companies were not included in the taxation calculation.

the academics quoted who oppose privatisation.) This has been done internationally. In Buenos Aires the number of staff was reduced by under 50% (from 7,600 to circa 4,000)[642] when privatisation took place. Similar figures can also be seen in Manila (Philippines)[643], with a reduction of over 50% and Conakry (Guinea) with a reduction of around 30%[644].

One of the biggest fears, which related to privatisation in England and Wales was that in the short term there would be job losses and indeed there were. From 1990 to 1999 employment in the ten regional providers fell by 21.5%.[645]

Many employees did however accept generous early retirement packages and voluntary redundancy as opposed to being forced out of employment.[646] Those who remained in the industry were regarded as being well equipped for the posts they held which was contrary to the initial private sector perspective of government workers.

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[642] Loftus, A and McDonald D "*Of Liquid Dreams: a political ecology of water privatisation in Buenos Aires*" Environment and Urbanization Vol 13 (2) October 2001
[643] Dumol, M "*The Manila Water Concession*" World Bank, 2000
[644] Clarke, G and Menard C, "Measuring the welfare effects of reform: urban water supply in Guinea" World Development 30 (9) (1517-37)
[645] Lobina, E., 'UK Water Privatisation: a Briefing' Public Services International, University of Greenwich, February 2001 (http://www.psiru.org/reports/2001-02-W-UK-over.doc)
[646] See Appendix 1, Interview with Martin Ross of South West Water (Pennon).

"*I used to think everything public sector or ex-public sector was negative. That was harsh and there are some aspects of it that are very good, like the dedication to the job.*"[647]

Since the initial job losses the private sector have increased their workforce as time has passed for example from 2002[648] to 2011 employment rose by 15% from 25,683 to 29,561[649].

For a professional analysis on the increase of employment it is efficient not to consider the rise of contract workers. If contract workers were included in the overall employment rise from 2002 to 2011 then the total workforce would be 578,182, in percentage terms an increase of 189%. If the contract workers were considered in isolation their rise from 2002 – 2011 would be 1205%. Although there have been obvious increases in the use of contract workers to dissect exactly how many would have been under the employ of the State had privatisation not taken place would be an unreliable estimation. What can be stated is that use of contractors by the private sector is

[647] 'United Utilities Chief to Step Down' Financial Times, Tuesday November 23, quote by Philip Green.
[648] It should be noted that OFWAT do not have the statistics of employment pre 2002,.
[649] Figures provided directly to author by OFWAT, see Appendix 13

increasing as is the private sector's own employees. [650]

Although not all of the authorities have increased every year and at the same rate each authority has increased their employees over the past nine years. The number of employees correlates to the size of the company and their distribution network with Severn Trent[651], United Utilities[652] and Thames Water[653] having the largest number of employees.

Environment

Environmental Quality

"*Privatisation has had hugely detrimental effects on the environment...". From every point of view bar that of the shareholders and corporate executives who have grown rich on it, privatisation in Britain has been an unmitigated disaster*" [654]

[650] Figures provided directly to author by OFWAT, see Appendix 13
[651] As of 2011 Employees = 5,128
[652] As of 2011 Employees = 4,631
[653] As of 2011 Employees = 4,805
[654] Liotard, K and McGiffen S, "*Poisoned Spring, the EU & Water Privatisation*" Pluto Press, 2009

This source does not however seem to have taken this information from any factual source. It is factually inaccurate and thus misleading based on the statistical findings verified by this study there can be shown to have been environmental improvements since privatisation. The massive investment by the firms following privatisation, which was roughly £3 Billion per year has dramatically increased the quality of water and its surrounding environment.

" [Before privatisation] Britain was the 'Dirty Man' of Europe. This was shown by the lack of fish species in the rivers and dirty beaches, somebody had to pay for it… The quality of the water has very much improved if you look at the environmental regulations that have come from Europe. The UK has gone up significantly, for example there are more fish in the Thames – this is down to the investment post privatisation."[655] This quotation from Ofwat the regulator is mirrored in the environmental statistics which have to be provided and independently verified. The statistics shown below mirror this statement and there is a clear and visible improvement in several areas.

[655] Interview with David Hackett, OFWAT, See Appendix 1

Water Improvement Statistics

Bathing Waters

"*In 2010/11 92.1% of Europe's coastal bathing waters and 90.2% of inland bathing waters met the minimum quality standards. Only 1.2% of coastal bathing water and 2.8% of inland sites were non-compliant. The remainder are unclassified due to insufficient data….In The UK, 1990 using classifications brought by European Standards classified 33.2% were compliant with both the mandatory and guide values of the European Directive; 44.4% were compliant with the mandatory values of the Directive and 22.4% were not compliant with the Directive. In 2010 81.7% were compliant with both the mandatory and guide values of the European Directive; 15.1% were compliant with the mandatory values of the Directive and 1.8% were not compliant with the Directive*."[656]

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[656] UK Swimming Beaches lakes and rivers ranked and mapped, The Guardian 16 June 2011:
(http://www.guardian.co.uk/environment/datablog/2011/jun/16/uk-swimming-beaches-bathing#data)
See Also: 2011 Summary Report / Bathing Water Directive, DEFRA, 2011
(http://www.DEFRA.gov.uk/publications/files/pb13696-summary-report-bathing-water-111221.pdf)

In 2010 85.7% of bathing waters were seen to meet EC Guideline Standards compared to 53.3% in 2000,[657] a sterling improvement within a decade.

Rivers and Canals (Biological Chemical and Nutrients)

The quality of rivers and canals is regularly monitored and the information made public by the Environment Agency.[658] The way in which rivers and canals are being monitored is however becoming more sophisticated to meet the demands of the Water Framework Directive and is thus in a transitional phase.[659]

Biological Quality

In 2008, 72 per cent of English rivers were at this level which is an increase from 55 per cent in 1990.

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[657] http://www.DEFRA.gov.uk/news/2010/11/15/bathing-news/
[658] From which the information on the Rivers and Canals was derived: (http://www.environment-agency.gov.uk/research/planning/34383.aspx)
[659] As can been seen from the statement made by the Environment Agency: (http://www.environment-agency.gov.uk/homeandleisure/37811.aspx)

Chemical Quality

In 2008, 79 per cent of English rivers were at excellent or good quality, which is an increase from 55 per cent in 1990.

Nutrient Status

In 2008, 51 per cent of English rivers had high concentrations of phosphate compared with 69 per cent in 1990. High concentrations of nitrate were found in 32 per cent of English rivers in 2008 compared with 36 per cent in 1995.

Serious Pollution Incidents

The Environment Agency has recorded that Serious Pollution Incidents have fallen Nationally by 52%. Unfortunately incidents related to water treatment or waste treatment in 2000 were marked as 120 and in 2011 this number was 120 (the previous year being 65). This was 50% of all Serious Pollution Incidents for the year. (It should be noted however that water companies and waste treatment/ landfill have the most permits. For those sectors the incident number per permit is lower than average for all sectors). Most of these were sewer related incidents and for the preceding three years the

number was almost half of that of 2011.[660] Not all forms of pollution increased as CO2 emissions were reduced by 6% in 2011[661].

From the information gathered the reduction of Serious Pollution Incidents is the area which since privatisation has overall improved (as an average) but still needs to be vigilantly monitored and reduced.

Leakage Reduction

" *[Before Privatisation] There was a neglected infrastructure with limited investment, an increase in the leakage, lots of pipes were over 100 year old, there was a view that the public authorities were not efficient and there was a view at the time that tax payers did not want to spend any more*."[662]In addition the structures have been well maintained, which can be seen by the fact that leakage rates have fallen by 35% (2010) since their peak in 1994-1995[663]. Indeed this continues to improve: "In 2011-12, all of the companies met their targets for reducing water leaks from their networks. The level of

[660] "Sustainable Business Report 2011" Environment Agency, October 2012 (http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/LIT_7482_4a39e8.pdf)
[661] OFWAT Webpage: (http://www.Ofwat.gov.uk/regulating/reporting/rpt_los2012environment)
[662] David Hackett, OFWAT, See Appendix 1
[663] http://www.Ofwat.gov.uk/publications/focusreports/prs_inf_pricelimits.pdf

leakage is now at its lowest level since records began in the early 1990s and the water saved is equivalent to meeting the needs of 1.7 million people every day.[664]" Leakage is still a concern not only for the environment but the providers as it causes unwanted expense and unnecessary pollution and reduction is continually being advanced.

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[664]OFWAT Webpage:
(http://www.Ofwat.gov.uk/regulating/reporting/rpt_los2012reliability)

Conclusion

Effective Provision can be defined in different ways and have a different focus for different academics. Taking the main factors of efficient provision from a variety of academics and analysing if there has been an improvement in these areas since privatisation the answer would be yes. In addition if one was to compare the results with European and National standards one can see that England is providing a service, which is above the set requirements. There has been a monitored and dramatic improvement at almost every environmental level, however one area in which there needs to be continued focus and improvement is in the sector of Sustainability and specifically Catchment Management which is discussed in the next chapter. Before this it is important to focus on the provision in Wales, which also has private provision, which is however structured differently to its English counterpart.

Part 3

Welsh Water (Dwr Cymru)[665]

Introduction

Welsh Water is another example of unique water provision. Unlike Scottish Water it is completely private, but holds a different structure from the corporate providers in England. This section of the chapter shall describe Welsh Water, its establishment, legal structure and liabilities. It shall also describe the progress since establishment. The purpose of the analysis of Welsh Water is to ascertain whether its provision is one which is effective. Its effective provision shall be ascertained under the six key elements (performance indicators) of effective provision. Integrated into the explanation of Welsh Water and the statistics demonstrating various elements of its provision, is the interview with Nigel Annett. Nigel Annett

[665] Dwr Cymru is Welsh Water translated into the Welsh Language. Welsh is still widely spoken as the first language in Wales by many inhabitants.

was the founder and has been Welsh Water's Managing Director since its inception[666].

Provision

Welsh Water is the only provider to Wales of both domestic and non-domestic water and covers roughly 1.4 million homes and businesses and 3 million customers, which supplies 828 million litres of water every day. It is sixth largest of the ten regulated water and sewage companies (Wales and England). It has 836 sewage treatment works and 67 impounding reservoirs. Many of the reservoirs and the land surrounding the reservoirs are owned by Welsh Water and it manages around 42,000 hectares of land. Welsh Water is the fourth larges employer in Wales and employs (directly) over 2,000 individuals.[667]

[666] Annett, Nigel founder and Managing Director was interviewed by author, on April 17 2013. In addition to this Robert Brown, the Generation Manager provided a full site visit explaining the full treatment process of the water plant, including the process, which transforms sludge into energy, which partially fuels the water treatment plant. It should be noted that during the meeting with Mr Annett the Head of External Relations, Heulyn Gwyn Davies was present and contributed. See Appendix 1 for full Interview.

[667]Welsh Water Web:
http://www.dwrcymru.com/en/Media-Centre/Fast-Facts.aspx

The Demise of Hyder

Welsh Water was privatised by the Thatcher administration at the same time that other water Privatisation occurred in 1989. Hyder PLC was created in 1996 when the corporate entity providing Welsh Water purchased SWALEC, it grew to become the largest employer in Wales which was private. It owned not only the water provision of Wales, but also provided the area with gas and electricity. In addition it had interests in leisure, construction and transit vehicles. When Hyder was formed through the purchase of SWALEC, which was bought for £872 Million, Hyder accepted huge debts not just in this company, but in its other corporate arms.

Unlike the other nine water and sewage providers in England, Hyder was a large company with a water section as opposed to a company specialising in Water provision. The diversity of its assets caused eventual strain and the debt to return ratio increased. The height of the share price was 1048p in January of 1998, which plunged to 179p in March 2000[668]. The cause of the fall is not to be blamed on one area in isolation, but an amalgamation of a variety of factors including a change in taxation and the awareness of

[668] Statistics (London Stock Exchange)

investors to the vulnerability of its operations due to excess debt. Hyder's over ambitious growth was the cause of its demise.

It is not the objective of this work to analyse the precise reason why this one provider economically failed whereas every other provider has financially managed to be profitable (profitability of the other providers shall be discussed later). What is evident is that Hyder did not operate the water business for long and Hyder was in principle a huge private entity, with a water interest. Each other private provider in England has, on the whole, not only been a water focused company, but has maintained its primary focus as water provision. Hyder financially failed as a company and with that company its water division also succumbed to its inevitable termination.

Establishment and Composition of Welsh Water

In 2000 British Gas purchased Hyder's retail electricity operations and eventually in 2001 Glas Cymru (the organisation which is now Welsh Water) purchased by what some have called a 'bad tempered auction'[669] its

[669] Collins, Neil "*Why it's raining dividends in Wales.*" The Spectator, 30 January 2008

water supply business.[670] The only way that Welsh Water could and indeed did purchase the provision was through the debt market. Bonds were issued to raise the capital needed to acquire Welsh Water, which was purchased in May 2001 for £1.9 Billion. The bonds were of different maturities and ratings and ranged from effective penny (junk) bonds to more secure bonds. Since 2001, a further £1 Billion has been raised by bonds since the initial purchase. S&P (Standard and Poor's is a financial rating agency[671]) have upgraded Welsh Water's Bonds six times and they now have the highest security rating possible and only issue one type of bond. The gearing (debt relation to the regulatory asset value) was initially 93%, which has now been reduced to 65% in 2013.

Welsh Water is a non-for profit company limited by guarantee. The state has no ownership in any form and has no involvement of the running of the company. The main difference between a company limited by shares and that limited by guarantee is that the company limited by guarantee does not have shareholders but individuals who are called members[672]. It is possible

[670] It should be noted that the purchase was not actually from Hyder, but a company called Western Power Distribution, which won a takeover bid in August of 2000.
[671] Standard and Poor:
http://www.standardandpoors.com/home/en/us
[672] Companies Act 2006, Part 1, Section 5:
http://www.legislation.gov.uk/ukpga/2006/46/contents

for a company limited by guarantee to distribute profits to the members, but in the case of Welsh Water the profits are distributed through a reduction in bills to those receiving water from Welsh Water (predominantly Welsh individuals). It is common for example with companies holding a charitable status to be formed in this way an example of which is OXFAM.[673] It should not be deemed that because this is a different entity to the usual private company limited by shares, that this corporate organisation is in any way not independent or privately owned or a reduced form of private ownership. It holds similar rights and responsibilities as a private or public limited company and can be liquidated or prosecuted.

The chairman of Welsh Water describes the structure as '*capitalists without shareholders*,' but Nigel Annett prefers the term 'customer owned'[674] During the interview with the founder of Welsh Water, Nigel Annett[675], he was under no doubt that the company was a completely private entity.

More information on Companies Limited by Guarantee can be found at the State Run 'Companies House':
http://www.companieshouse.gov.uk/index.shtml

[673]The Charity OXFAM is an international relief company:
http://www.oxfam.org.uk/

[674] Annett, Nigel founder and Managing Director of Welsh Water was interviewed by author see Appendix 1.

[675] Annett, Nigel founder and Managing Director of Welsh Water was interviewed by author see Appendix 1.

"*We are a completely private entity, legally and technically, there is no consideration about that we are run on private capital working under license and we could go bust at any point. In every legal form we are a company*."

Welsh Water is governed by the same governmental regulator as the English providers, thus Ofwat, is the monitor for price for example. It is treated legally in the same regulatory way as another English provider unlike Scotland, which has separate regulation and legislation. " *We can compare with the water measures as measured by the regulators (safe drinking water) for example. We sample everything and the regulator regulates. We are regulated in exactly the same way as any other company (the other 9 sewage and water providers) in England*."[676]

The Constitution of Welsh Water states that a majority of the board be independent of executive management, currently the board comprises of seven non-executive directors and three executive directors. In addition there are 60 Members from a variety of professions across Wales who are responsible for holding the board to account for their actions. The members,

[676] Annett, Nigel founder and Managing Director of Welsh Water was interviewed by author see Appendix 1.

although not involved in the day to day running of the business, are informed by the board on a constant basis about various progressions and meet twice a year, once during the Annual General Meeting.[677]

Operation

Essentially the Welsh Water model is based on the premise that the advantages of privatisation could be maintained such as; lack of governmental interference, access to capital, focus on performance, commercial drive and cost efficiency. These benefits would however be managed in a non-for profit organisation which would operate in a way by which the customers would benefit from the returns. These benefits would take the form of a reduction in rates, social tariffs or additional investment to infrastructure.

The ethos fostered by that of Nigel Annett, is that shareholders are not the necessary pressure propelling the management into better performance but

[677] In addition to the information gathered from the interviews of key individuals in Welsh Water (See Appendix 1), information was provided by Welsh Water in the form of word documents and slide shows. This information in addition to that which is listed can be obtained by request to the author. Also see:
'The Future of Utilities Conference' Welsh Water Presentation, 2013
Letter dated 8 March 2013 Sent by Welsh Water (Nigel Annett) to the Chair of the Environment and Sustainability Committee of the National Assembly of Wales.

that this pressure can come from other factors including a belief in purpose and the desire to provide the customer with the best possible service for the lowest possible price. In addition there still remains the regulatory pressures to comply with the variety of legal standards.

" *I don't think shareholders have a part to play in this provision and I don't think shareholders should make money from this. We have other disciplines including regulators and league tables we do not need shareholders to give us that push*."

Welsh Water has what it calls its '*Virtuous Circle*'[678] The first stage is to produce a good service. The service is financed by Bond investors, these Bond investors desire improved credit ratings which secure the return on their investment and leads to lower interest costs when new Bonds (funds) are raised for investment (since inception the credit rating has been raised six times). Better ratings materialise the possibility to raise more money from the private market at cheaper rates. These cheaper rates keep total costs down and thus the savings can be passed to the customers. These now

[678] As Discussed in the Welsh Water Presentation Document titled '*The Future of Utilities'* March 2013.

reduced bills in turn support the lowering of credit ratings in the future, thus the cycle continues.[679]

Ethos

The Ethos of Welsh Water is very unique. It should be noted that although Nigel Annett did not want to operate under a company limited by shares (unlike the other providers in England) he thinks (as did the other members of Welsh Water that I conversed with) that privatisation was a good thing in England.

"*[Privatisation] was very, very important. Taken out of politics and the public sector yes, once it [provision] was made [by] a company it changed the dynamic completely. Privatisation was a good thing*."

" *Privatisation of the water industry has delivered very big improvements in cost efficiency and has enabled record levels of investment without government subsidy (to date) which has transformed water and environmental quality standards; customer bills have risen but by*

[679] Annett, Nigel founder and Managing Director of Welsh Water was interviewed by author see Appendix 1.

considerably less than would have been the case had the industry remained in the public sector (Ofwat put this saving at £100 per household customer) Research shows however that customers do not recognise this good outcome because (when asked for an opinion) they generally do not like the idea of their local monopoly water supply being owned and run for a profit, legitimacy suffers and costs are higher as a result."[680]

Interestingly as shall be discussed later those who were interviewed all shared the same view that the mutual model does work well for Wales, but that it would have been impossible to implement in the other regions in England with the same positive results.

Welsh Water was principally set up by Nigel Annett (and one other who is still a member of the board). His main aim was and still is to provide an institution run for the customers. He has been at the helm of the organisation since inception and intends to stand down in 2014. His influence cannot be understated as it has been his entrepreneurial drive which has made Welsh Water not only possible but considerably improved.

[680] Letter dated 8 March 2013 Sent by Welsh Water (Nigel Annett) to the Chair of the Environment and Sustainability Committee of the National Assembly of Wales

Improvements

Customer service improvements, investment and reduced bills are all elements of the high satisfaction, but Mr Annett puts the '*culture*' of the Company as the key to its success. Recently Welsh Water carried out a staff engagement survey and ascertained that 83% of employees were 'Proud to work for Welsh Water'. In addition 68% said that they felt a 'strong sense of belonging to Welsh Water'. Having read this survey it is clear that there are areas which need improvement, for example only 60% said that 'Welsh Water are committed to developing staff' and only 51% stated that 'The Executive Team are sufficiently visible'. It is the case however that as a company they strongly believe that the interest of the board the employees and the company as a whole prioritise the needs of the customers. In the survey 80% agreed that 'Welsh Water puts customers first'.

'Customers also think we are doing well – we get high scores there too and business customers. We were recently top on the Ofwat customer survey.'[681]

[681] Annett, Nigel founder and Managing Director of Welsh Water was interviewed by author see Appendix 1.

One major development is that since Welsh Water was founded it has in-sourced huge amounts of staff who were previously out sourced. '*In - sourcing was a very great part of creating the firm. When we ended the outsourcing we carried out a staff survey people were very angry that they were outsourced in different companies and this has been very much improved. 83% of employees said that they were proud to work for us. Employees think we are doing a good job for a good reason.'*[682]

In addition to improvements in perception both by customers and employees there have been various areas of performance standards, which have also seen improvements.

Performance Improvements

Drinking water quality is the most important factor in the provision of water. In Wales quality is monitored by the Drinking Water Inspectorate and performance is measured against key indices specified by the Drinking Water Inspectorate. Such measurements can be compared against the other Water and Sewage providers who are also monitored in this fashion. In

[682] Annett, Nigel founder and Managing Director of Welsh Water was interviewed by author see Appendix 1.

Welsh Water there are four Board Committees one of which is the Quality and Environment Committee[683]. This committee meets on a monthly basis to discuss maters relating to the water quality among other things and reviews the results of key performance indicators monitored by the Drinking Water Inspectorate. Each year a report of its work is published[684].

The Drinking Water Inspectorate (as shall be discussed at length later in the text) is the Regulatory body which monitors and regulates the quality of the water provided by water providers to customers in England and Wales. They operate by monitoring certain indices, which are standardised across the providers. Thus ensuring a constant and equal form of review. As can be seen from the report of 2011 the provision in Wales is of a good standard:

"*The results of testing in 2010 demonstrated that the overall quality of drinking water in Wales was good. The figure for compliance with drinking water standards at consumers' taps was 99.96%, up from the figure of*

[683] Welsh Water Webpage:
http://www.dwrcymru.com/en/Company-Information/Glas-Cymru/Board-Committees.aspx
[684] The Quality and Environment Committee Report 2010/11.
http://www.dwrcymru.com/eng/library/company_reports/current_year/dcww_quality_environment_2010.pdf
See Also Report from the Chairman 2011/12:
http://www.dwrcymru.com/~/media/Files/Reports/2012/QEC%20%20Report%20for%20Chairman.ashx

99.95% reported in 2009 and in line with the industry overall average. This figure is made up of the results of all the tests for 39 parameters with European or national standards. The circumstances of the few failures and the actions taken to safeguard public health are discussed in the body of the report. When the Welsh water industry is judged by the Inspectorate's four indices of water quality performance, which look in turn at water treatment (comprising process control and disinfection), service reservoir integrity and network maintenance, the main change in 2010 was improved process control at treatment works (100%) along with improvements in the figure for reservoir integrity (99.97%) and network maintenance (99.83%). However, there was a decline in the disinfection index to 99.89%"[685]

Welsh Water, as can seen above, provide a high level of quality water. This is not to say that there are not areas in which it needs to improve including discolouration.

"*The average age of Welsh Water's pipes is about 50 years, although some pipes are over 100 years old. The current condition of our water pipe*

[685] Drinking Water Inspectorate July 2011 : http://dwi.DEFRA.gov.uk/about/annual-report/2010/wales.pdf

network can affect water quality at the tap, especially colour, as well as the level of leakage, pressure and the number of bursts."[686]

Nigel Annett admits that there are issues, which need to be dealt with in relation to dis-coloured water (due to iron pipes) and flooding (and associated pollution). Pollution and serious pollution is a concern, which is being monitored. The 2010 report states there were nine serious pollution incidents[687] The same report highlights that in the same year the Environment Agency Wales (EAW) prosecuted Welsh Water directly for 4 pollution incidents which comprised of 6 offences. In relation to the other providers Welsh Water was the fourth worst offender with North West Water and Southern Water being the worst with seven offences.

Many things have been positive. Leakage has reduced by 33% since Welsh Water Ownership. Recycling of Waste to energy now saves Welsh Water around five Million pounds per year and reduces toxic by-product.

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[686] Welsh Water Web Page: http://www.dwrcymru.com/en/Company-Information/Business-Operations/Drinking-Water-Quality.aspx

[687] Annual Report of the Quality and Environment Committee, Welsh Water, (2010): http://www.dwrcymru.com/eng/library/company_reports/current_year/dcww_quality_environment_2010.pdf

Bathing water and beaches are at a very high standard with all 81 Beaches passing all safety requirements. Blue Flag[688] awarded Wales 45 Flags (beaches and marinas) as opposed to 69 in England, it should be remembered that Wales is considerably smaller than England (and has fewer beaches). Blue Flag is an award by the Foundation for Environmental Education[689] which provides flags to beaches of high environmental standing. This award is nationally respected in Great Britain.

It is also important to note the improvements in customer satisfaction. The Welsh Water statistics show that household customer satisfaction is currently running at over 90%[690] and that they now receive more written thank you notes than complaints. The industry as a whole in 2011-2012 found a reduction of complaints by 12%, but Welsh Water managed to reduce their complaints by half.[691] In addition, business customers were also satisfied by the service provided by Welsh Water with 85-89% stating they had 'overall satisfaction' with provision.

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[688] Blue Flag Webpage:
http://www.blueflag.org/
[689]Foundation For Environmental Education Webpage:
http://www.fee-international.org/en
[690] Welsh Water Web:
http://www.dwrcymru.com/en/Media-Centre/Fast-Facts.aspx
[691] "Welsh Water, Customer Complaints Halved." BBC News, 25 September 2012
http://www.bbc.co.uk/news/uk-wales-19710753

Water Bill

The Average Bill is £434 (2013-14) a £7 increase from 2012[692]. This is the lowest increase in the industry (but not price).

The Bills range in price from £335 (Severn Trent) to £499 in South West Water. Welsh Water is joint 4th (With Anglian) most expensive. So although the incremental increase is relatively low they are still more expensive than most.[693] In the 2012/13 prices which have later been used to demonstrate the price of the English Providers it can be seen that Welsh Water were the second most expensive provider with the cheapest provider being Yorkshire Water at £361. Welsh water itself states that the bills are one of the areas which may be improved upon, recognising that they missed the operating costs of 2012 and that bills are still higher than average.

[692]Welsh Water Webpage: http://www.dwrcymru.com/en/News-Summary/2013/02/Welsh-Water-households-see-lowest-bill-increase-from-April-2013-for-the-third-year-running.aspx
[693]Welsh Water Webpage: http://www.dwrcymru.com/en/News-Summary/2013/02/Welsh-Water-households-see-lowest-bill-increase-from-April-2013-for-the-third-year-running.aspx

The Unique Nature of Welsh Water

"*Pay is for example half the pay for me and others in the firm is roughly half that of other firms in England . I didn't want bad press about too much pay. . . My pay is 50% linked to performance index. This score is known across other companies. . . Chris Jones and Myself started this [Welsh Water] one of the biggest challenges is to continue the culture - for it to run itself – my biggest worry is if the board (who are independent) bring someone from outside the company who just doesn't get it. . . I feel very Welsh I am bi lingual my children are and I have 'gone native'. . .*

Would we have done what we did for part of England – no. It is very political historically. Valleys were flooded for England – torn up and villagers relocated. We have a devolved government and he would say the Welsh assembly would say from the dispute in the 1960's, from water in Wales, this was a big consideration for this to happen. . .

My business partner is also from Wales – the working language is Welsh – 1/3 of the workforce's first language is Welsh. It gives us an identity which

we are proud of. Other companies don't have an identity that would make it possible. . .

If we sold Welsh water tomorrow and we could - and we sold it for 5.5 Billion, each Welsh individual would get £2,000 – don't tell them though!"[694]

Whether this form of mutual could operate now or indeed could have done in the past is not the question, which this thesis seeks to answer, but to evaluate the effective nature of the private water provision in Wales. Wales has an unquestionably unique system and it should be noted that those who have established this system do not think that it could have been nor could be established in the other regions in England with such positive results. These however are opinions, which must be analysed.

Analysis of Interview (Comment)

The statistics which were provided, have been verified by counterchecking with corporate documents which are submitted to the regulators (it would be

[694] Annett, Nigel founder and Managing Director of Welsh Water was interviewed by author see Appendix 1.

a legal offence to submit incorrect information). Thus the information provided in corporate documents has been taken as true. The most pertinent information gathered from the information was not however the facts but the opinion of the executives of Welsh water.

Nigel Annett and Heuly Gwyn Davies were of the opinion that Welsh Water was a unique success, which could not have been implemented in any of the other regions. They thought that the system worked because of the unity, which the country and the company had towards Welsh Water. To place this in context Wales was the only part of Great Britain to be conquered by England and to a degree consumed by England. Indeed as Mr Annett stated many Welsh Valleys were flooded and homeowners displaced in order to provide water to England[695]. This is quite different from Scotland, which voluntarily joined England through a joint union of monarchs[696] and parliaments[697]. Ireland shall not be considered, as it is not part of the Isle of

[695] "Official Apology Over Tryweryn" BBC News, 19 October, 2005: http://news.bbc.co.uk/1/hi/wales/4354256.stm

[696] In 1603 James VI the King of Scots unified the thrones of Scotland England and Ireland through accession as Queen Elizabeth I of England died unmarried and childless and James was her first cousin twice removed. The succession was agreed by the English monarch Elizabeth I and when she died there was no civil revolt or unrest. A British Crown was not created however the British people were formed as a Kingdom.

[697] Almost 100 years from the Union of the Kingdoms there was a Union of Parliaments between Scotland and England. The Treaty of Union was signed in 1706 following respective acts in both Scotland and England with the purpose to unify the English and

Great Britain nor of this study. Welsh pride in their water and Welsh Water's pride in their provision was something that was highlighted by the executives and was evident from all the employees.

This pride is deserved as Welsh Water has succeeded in providing a service which is both affordable, economically viable and clean. Welsh Water was and still is run by the vivacious and motivated Nigel Annett who since founding the mutual has steered the company through troubled beginnings into efficient provision. The staff of Welsh Water including Nigel Annett take considerably less salary than their counterparts (in England) and although this is admirable the sustainability of this is questionable. Nigel Annett has been the driving force of this policy and thus it is unknown if such selflessness would continue after his departure. Nigel Annett made clear that he did not want the success of Welsh Water to be damaged by bad press concerning high executive salaries and thus he places the company before his own financial gain. An admirable position, which this Thesis has found to be in isolation when compared with the other providers.

Scottish Parliaments, these subsequent Acts took effect in 1707. In 1998 The Scotland Act established certain devolved legislation, which is now dealt with by the Scottish parliament, but all senior legislation is still governed in London at Westminster. It should also be noted that there is a National Assembly for Wales which (after a referendum in 1997) was empowered in 1998 by the Government of Wales Act to establish a devolved assembly, which does have certain minor law making powers.

Richard Ackroyd the Chief Executive of Scottish Water spoke of his yearning to raise money through the debt market and one option would be through this form of privatisation.[698] Comparing one provider with the other the clear difference lies in the fact that there is direct government interference with Scottish Water as opposed to Welsh Water where there is government assistance (when needed) but the government has no actual control of the provision. Nigel Annett was clear to highlight the fact that he thought it was of vital importance not to have government interference.

"*We get no financial benefits unlike Scottish water. We raise our money from the markets. The ethos is very similar to Scottish Water. Culturally they are very similar to ourselves. I knew Richard Ackroyd and they were very keen to adopt our type of model. The trouble of Scottish Water is that they have politicians crawling all over them all day – they spend their time managing politicians. They spend time with the politicians, as they own the*

[698] Sadly Richard Ackroyd died before the interview with Welsh Water, but his comments were recorded and his views well known to both Nigel Annett and Welsh Water.

company. With us, our politicians, they are interested in what we do but they do not interfere and they do not own our company."[699]

The second and arguably correlated difference is that Scottish Water makes a financial loss and is dependent on the 'loan' by the government of £140 million per annum whereas Welsh Water and the other English providers receive no form of supplement and do not need it.

Evaluation of Effective Provision

It is not for this thesis to try and ascertain if such a mutual would work in other areas and to what extend the concerns of Welsh Water in transferring their model to other parts of England are valid. As an isolated model, as a study of Privatisation in one of its forms, Welsh Water can be said to have effective provision. This can be broken down into the six key elements (performance indicators) of effective provision.

Economic, Price, Access, Quality, Environment and Sustainability.

[699] Annett, Nigel founder and Managing Director of Welsh Water was interviewed by author see Appendix 1.

Economic Viability

Welsh Water is not only economically viable, but it is in profit. In 2011 The pre tax profits were £56 Million.[700] In 2012 the pre tax profit was listed as circa £7, million.[701] This is not a huge amount for such a large operation and in comparison to other English Operators[702] with United Utilities making profits of around £600 Million and Severn Trent with around £250 million.

In addition to it producing a profit it is necessary for the provider to invest in the infrastructure and in the next 3 years (2012-15) Welsh Water has committed to invest £1 Billion on infrastructure.[703]

Access

Universal access does not vary across Great Britain and the access to water is not a domestic issue or concern. Every household who wishes access to water has access to water.

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[700]It should be noted however that considerable amounts are being spent on infrastructure http://www.dwrcymru.com/eng/library/company_reports/2011/gcc_report_accounts_2011.pdf

[701]http://www.dwrcymru.com/eng/news/displayNews.asp?ID=1901
http://www.bbc.co.uk/news/uk-wales-18438268

[702] See Appendix 11

[703] http://www.dwrcymru.com/eng/news/displayNews.asp?ID=1901

Quality

With the figure for compliance with drinking water standards at consumers' taps being 99.96%[704] the quality of water provided to the consumer is of an extremely high level.

Price

The Price of Welsh Water is possibly the main area where it recognises that improvements need to be made. In 2013/14 it was fourth most expensive and in 2012/13 it was the second most expensive. That being said the industry as a whole from the cheapest to the most expensive in England and Wales is below many European averages including Paris and Copenhagen, the later of which is almost double the British mean price.[705] Welsh Water does provide subsidies for those who are in financial need.[706]

[704] As of 2010 (Standards, are European Standards as described above).
[705] All average house prices are later listed and in addition compared to prices in Europe and America.
[706] "Those who cant afford have a discount we have 55,000 on social tariffs. In Wales 14% spend more than 5% of their income on water." Interview with Nigel Annett.

Environment

The environmental approach in relation to discharge and thus costal cleanliness has improved remarkably since Welsh Water came to control provision. Before, and during state provision, discharge from cleansing was disposed untreated into the sea. This raw sewage caused obvious health risks and left the Welsh coast scarred with beaches and shorelines which were unsafe to use. Now (as detailed above) all of the beaches in Wales pass requirements and over half have deemed to be of such a standard that they have been awarded the honour of blue flag certifications.

Sustainability

"*In relation to sustainable development and land management we own quite a lot of our own catchments – we sublet some to farms there is certainly a big agenda, (dissolved organics) is rising we think because of climate change, we are not sure, the old way is to focus on treatment, we are trying to improve wetlands in Anglesea*[707]*, to stop runoff. We are also trying to take rainwater out of the sewage systems because of the erratic storm weather,*

[707] A region of North West Wales.

which means take the rain water from the sewage system. We are trying to prevent issues at source."[708]

In relation to sustainability management it should be noted that Welsh Water as stated above and unlike many other providers, own a huge amount of the land and catchment from which the water is procured. This means that their focus can be more on what they need to directly do to sustainably coordinate extraction and have a positive impact on the surrounding environment. In addition to this at source sustainability practices are being incorporated. Welsh Water has an extensive Sustainable Future document, which outlines the sustainable nature of its planned future practice.[709] Priorities for 2015 include improving discharge, targeting zero serious pollution incidents, reducing the corporate carbon footprint by 25% and working with the Countryside Council for Wales to improve the environment and waterways. Welsh Water's sustainable development thus far has seen massive improvements primarily in the quality of beaches and the cessation of raw discharge. Like all providers Welsh Water must continually improve, as

[708] Annett, Nigel founder and Managing Director of Welsh Water was interviewed by author see Appendix 1.
[709] "Our Sustainable Future", Welsh Water, 2010: http://www.dwrcymru.com/_library/leaflets_publications_english/our_sustainable_future/our_sustainable_future.pdf

sustainability is a moving not a fixed standard, however they do have credible plans to do so.

Conclusion

Welsh water is a form of private provision. There is no state interference and it has to comply with the corporate legislation of England and Wales. In addition it is regulated and monitored by the same organisations as the English providers, including Ofwat, the Environment Agency the Drinking Water Inspectorate and the Consumer Council for Water. Welsh Water is a unique organisation, which operates in the form of a mutual. It has since inception been led by the same individual who has fostered a company which is focused on the customer, with very respectable results. It is not the design nor desire of this work to ascertain the likelihood of this structural success to continue once its founder leaves, nor to suppose if such a structure could have been implemented out with the region of Wales. The main objective of this study is to ascertain if this form of privatisation is effectively providing water under the selected elements of effective provision. This question has been answered in the affirmative. In addition to the elements of effective provision being met there is also a high regard for the businesses by their customers, which is shown in the high customer

satisfaction ratings. There are areas where Welsh Water is not comparatively superior to the English Providers, including their price applicable to customers and their overall corporate profitability. It is the case however that they are still profitable and providing a service at an affordable price. Welsh Water has in its unique form of privatisation, managed to construct a corporate structure with individual principles and effective provision. The sustainability of provision is one area in particular which deserves more focus as it is the area of provision in particular which is constantly changing and where there is always need for further development and improvement and thus the focus has been given to this topic in the next chapter.

Chapter 7

Sustainability

Introduction

Part 1 of this chapter discusses the important issues relating to Catchment Management. It discusses where there have been failures in Sustainable Development and the recent improvements that have been made. Ofwat's role in relation to Sustainable Development and catchment management is then discussed in Part 2, including what Ofwat's legal duties are, what it is currently doing and what should be done in the future.

Part 1

Catchment Management and Sustainable Development

The transfer from public to private was not a gradual, but an immediate process and to increase provision efficiency it is necessary to evaluate what has been done successfully and what still needs to be accomplished. Since

privatisation, water quality has improved, beaches are cleaner and environmentally, on the whole, from the increase in wildlife to the reduction in pollution, there has been a vast improvement. It is the case however that the management of the catchments must be improved. This has been highlighted by a variety of industry experts from environmental organisations to corporate providers. The government had the opportunity to consult and develop the consultations into action in their recent White Paper.

The DEFRA White Paper

On 30 November 2010 a workshop was held in London, which was led by RELU (Rural Economy and Land Use Programme) titled; "*Catchment Management for Protection of Water Resources*". [710]

The remit of the workshop on 30 November was to ascertain and evaluate a series of different approaches to managing land within a catchment, through the input of a variety of experts, stakeholders and government officials. The

[710] Please refer to Appendix 14 for a more comprehensive and detailed account of the Workshop and its preceding Conference. (Author in attendance)

result being that in June 2011 The Department for Rural Affairs and Agriculture (DEFRA) published a White Paper "The Natural Choice"[711]

The EA defines a catchment as: "*An area with several, often interconnected water bodies (rivers, lakes, groundwater and coastal waters)*"[712]. The importance of the catchment to the environment can't be understated as a natural and essential part of the hydrological system. Catchments incorporate Wetlands, which are one of nature's natural purification devices for water.[713]

In addition to the catchment objective the workshop's other objectives were to:

Consider competing stakeholder concerns and demands.

To evaluate different approaches from across the globe.

[711] "The Natural Choice: Securing The Value of Nature" DEFRA (2011) : (http://www.DEFRA.gov.uk/environment/natural/whitepaper/)
[712] Environment Agency: (http://www.environment-agency.gov.uk/research/planning/131506.aspx)
[713] See Appendix 16

To assess the various different catchment management concepts and how these may be applied.

To allow polarised members of the community who were affected by a variety of different factors to voice their concerns and propose suggestions to governmental and non governmental groups.

The workshop importantly included members of the Department for Food Environment and Rural Affairs (DEFRA) and the Environment Agency (EA) before the aforementioned White Paper had been drafted. They were present at the workshop and interacted with a variety of stakeholders and heard many diverse views, with the aim of incorporating these in the Paper.

Main Issues

The Workshop and Conference highlighted certain issues, which are summarised below:

Stakeholders are not sufficiently integrated into a catchment management System.

The decision making process in relation to catchment management needs to become more transparent.

The funding of catchment's needs to become transparent and accessible. More funds should be provided be this through; land owners, water providers or, directly through the Government or Government Agency.

Local interests must be taken into consideration.

Development of new national partnerships at a national scale must incorporate existing local and community partnerships.

Catchment management should include areas which have until recently been overlooked such as flood management and water quality.

Environmental institutions, government bodies, water providers and communities should be in a position where they can work easily together and importantly be able to share information.

From a ‘bottom up’ catchment operation land owners would directly be able to prevent pollution at source, which would not only help the environment but save the water company costs.

Suggestions for Improvement and Implementation

It was suggested that DEFRA could aid the process of catchment management by helping to implement the above points. In addition DEFRA could :

Offer specific funding

Manage (or facilitate the management of) certain elements of catchment management.

Ensure provision of adequate monitoring or maintenance.

Ensure that all stakeholders are utilised to produce the most efficient catchment partnerships.

Example of Catchment Gap:

One example of the gap in catchment management was highlighted by the Rivers Trust who stated that the areas around the rivers were not cleaned properly nor was there rubbish collection from the banks.

"*If there is rubbish in the water and causing a flooding risk the EA may do something about it. If the rubbish is on the bank – on the foreshore they will not. This is a statutory gap in the legislation!*

For example with fly tipping the EA has no obligation to remove the rubbish it is the landowner that has the duty to dispose of waste on their land. That obviously introduces an issue. It does mean that this issue can be ignored by government to a degree."[714]

[714] Ruggles Brise, Archie, Rivers Trust, See Appendix 1

White Paper Summary[715]

It was encouraging that DEFRA had the maturity and the intelligence to consult experts at an individual level and group level through the attendance of meetings and conferences. In addition to that they have not only considered the points which were raised but they have actively and thoroughly incorporated many of those points into the White Paper. This is positive and unusual.

The White Paper was launched by the Government to "*Mend the inherited damage to Natural Environment*" and was the first White Paper on the Natural Environment in over 20 years. The paper is not only extensive but comprising multiple pertinent goals and proposals. The below information focuses on that which relates to water, catchment management and in particular highlights the points which were mentioned to DEFRA during the conference and workshop in London and have since been incorporated into the White Paper.

[715] "The Natural Choice: Securing The Value of Nature" DEFRA (2011) : (http://www.DEFRA.gov.uk/environment/natural/whitepaper/)

The Importance of the Environment

The White Paper clearly highlights the importance of the natural environment and advocates '*Growing a Green Economy'* and in that green economy water is clearly highlighted both at a marine and freshwater level. "*More broadly we will achieve a better quality natural environment by taking and promoting concerted effort across our farm land, woodlands and forests, towns and cities, rivers and water bodies. We will press ahead with our ambitious commitments for the marine environment*."[716]

Sustainability of Water Sources

A key part of being environmentally friendly is sustainability and indeed sustainability of water. Without sustainable freshwater resources, degradation of the environment would be inevitable. The environment depends on fresh water and the constant supply of this allows for its sustainable growth.

[716] "The Natural Choice: Securing The Value of Nature" DEFRA (2011) : (http://www.DEFRA.gov.uk/environment/natural/whitepaper/)

" *A sustainable supply of good-quality freshwater for our economy, society and environment depends on functioning water ecosystems. Rivers, lakes and groundwater estuaries, wetlands and river corridors prove vital ecosystem services and public benefits. They regulate flooding and local climates, as well as supporting the dispersal of chemicals, energy and organisms between aquatic and terrestrial habitats.*"[717]

European Legislation and Sustainable Engagement with Landowners and Farmers through Watershed Partnerships.

The Introduction of the Water Framework Directive[718] and in particular Articles 13 and 14 not only highlights the importance of community involvement but, makes their involvement and consultation a legal imperative.

[717] "The Natural Choice: Securing The Value of Nature" DEFRA (2011) : (http://www.DEFRA.gov.uk/environment/natural/whitepaper/)

[718] Directive 2000/60/ EC of the European Parliament and of the Council of 23 October 2000, establishing a framework for Community Action in the field of Water Policy. (Water Framework Directive): http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2000L0060:20011216:EN:PDF

(13) "*There are diverse conditions and needs in the Community which require different specific solutions. This diversity should be taken into account in the planning and execution of measures to ensure protection and sustainable use of water in the framework of the river basin. Decisions should be taken as close as possible to the locations where water is affected or used. Priority should be given to action within the responsibility of Member States through the drawing up of programmes of measures adjusted to regional and local conditions*."

(14) "*The success of this Directive relies on close cooperation and coherent action at Community, Member State and local level as well as on information, consultation and involvement of the public, including users*."

Watershed partnership is one area which is being addressed by the Rural Economy and Land Use Programme (RELU)[719]. Recently the key members of the RELU team published an article (Benson et al) analysing certain key aspects of collaborative watershed partnerships. This the article highlights that such partnerships are '*complementing as opposed to replacing the*

[719] Dr David Benson and Laurence Smith were both interviewed for the purpose of this work. A full interview with both aforementioned can be seen in Appendix 1.
See for RELU Work:
http://www.soas.ac.uk/relu/

actions of the state led groups.' These groups are filling environmental gaps, which have occurred. These diverse partnerships have emerged to address different issues in different locations and are thus both region and problem specific.

National water legislation has thus far been sparse in imposing partnerships and the analysis of new legislation needed warrants further detailed study, which is not the desired remit of this paper. What was highlighted in the Benson paper was that there is as yet insufficient data to make an analysis on the progress of current partnerships. "*A major weakness - and thus a priority for further study in both the USA and the UK – is the lack of understanding of factors that will determine the longer term sustainability and success of collaborative watershed and catchment partnerships. In part, they remain a recent phenomenon and thus sufficiently long time series data for relevant indicators of process and outcomes are not available*."[720]

Sustainable engagement in catchment protection is nationally very important, with the potential for great environmental benefits. The way in which the current partnerships operate and their effective provision can and

[720] Benson et al, "*Collaborative environmental governance: Are watershed partnerships swimming or are they sinking?*" Land Use Policy, 30, 2013

should be studied once time has passed and information on these partnerships, many of which are relatively new, has been collected.[721] Examples of such partnerships are detailed later in this chapter.

National Legislation

DEFRA as a government body within the British Government is directed (and restricted) by National and European legislation. This is an issue which is importantly highlighted within the White Paper.

"*[In Relation to Directives such as] " The EU Water Framework Directive, we will carry out a full review of how we use advice and incentives for farmers and land managers and yields better environmental results... The Government is committed to protecting water ecosystems to achieve good ecological status through a river basin planning approach under the EU Water Framework Directive*."

[721] For more information on catchment management within Great Britain see: Benson et al " *Involving The Public in Catchment Management: an analysis of the scope for learning lessons from abroad."* Environmental Policy and Governance 22 (1), 2012

Catchment Management

Specifically DEFRA have made a real effort to incorporate holistic, multi level, catchment management into the White Paper, which incorporates a variety of stakeholders.

"*We need to increase the rate of progress towards good ecological status by working at catchment level to involve interested parties and address the pollution sources that are causing water bodies to fail. Local businesses, citizens and interest groups will play a significant part in determining and implementing the measures needed to achieve long-term improvements*."

Land Managers / Owners

Working not in isolation but in partnership with land owners and managers was highlighted to DEFRA to be a key issue in pursuing efficient catchment management and admirably this has been considered in the White Paper.

"*We want land managers to get returns from a range of ecosystem services in addition to those they get from food production. We will work with the*

sector to investigate the development of markets for these services. For instance , we will encourage water companies to obtain clean water through working with land managers in their catchments to reduce pollution at source…"

Local Partnerships

There are many problems arising from a top down approach to land and catchment management. Top down management cannot be specific enough to directly assess exactly what a specific location requires. A generic approach may work in certain circumstances when the problems and the landscape are similar, however in an environment as varied as Britain where one area can be in drought and the other flooded, specific information is essential. In addition to this the ever changing nature of the British weather means that the management needs to be constantly changing to accommodate the unpredictable weather.

Currently the problems with catchment management originate not from an over burdensome influence on management from central government, but a lack of structured management. It has been proposed that the structure

should originate at a local level and have government support and involvement. This is what is now being proposed by DEFRA.

"*We want to see widespread and joined-up partnership action. We will encourage and support Local Nature Partnerships where local areas wish to establish them. These partnerships will work at a strategic scale to improve the range of benefits and services we get from a healthy natural environment. They will aim to improve the multiple benefits we receive from good management of the land."*[722]

Administrative hurdles can often hinder the progress of local groups in achieving their aims. DEFRA proposes to aid the partnerships in solving cross boundary issues. In doing so this would help develop a system that works nationally but operates at a local level. "*Such partnerships may cross administrative boundaries, so that they can reflect natural features, systems and landscapes, and work at a scale that has most impact. Where necessary, they may join up on cross-boundary issues, such as landscape scale action for biodiversity, water management, green infrastructure, air quality and*

[722] "The Natural Choice: Securing The Value of Nature" DEFRA (2011) : (http://www.DEFRA.gov.uk/environment/natural/whitepaper/)

ecosystem services more widely. At this strategic level, we envisage that there could be in the order of around 50 partnerships across the country."[723]

Importantly a holistic community partnership is not defined by simply linking one organization such as the Rivers Trust, or a utility provider to the Government but it must involve those who actually dwell in the catchment. A society is no more than a group of individuals and to access the knowledge and support of the society it is imperative to work in conjunction with the individuals in the community. This is also a point which has been taken into consideration by DEFRA.

"*Effective partnerships engage and win the support of local people and communities they serve. They may comprise people from local authorities, businesses, statutory authorities, civil society organisations, land managers and local environmental record centers, as well as people from communities themselves."*[724]

[723] "The Natural Choice: Securing The Value of Nature" DEFRA (2011) : (http://www.DEFRA.gov.uk/environment/natural/whitepaper/)
[724] "The Natural Choice: Securing The Value of Nature" DEFRA (2011) : (http://www.DEFRA.gov.uk/environment/natural/whitepaper/)

Local Nature Partnerships

Local Nature Partnerships, (which shall be expanded upon later in the chapter) are one way in which the concept of individual and community involvement can help manage a catchment. This is a move towards the concept becoming a reality.

The Partnerships would include individuals from the public, from private corporations as well as representatives from non governmental and governmental organizations

The role of the Local Nature Partnership is broad but the two main elements are in informing the Government (or government bodies) about what needs to be done within the catchment. In addition to this they would monitor and evaluate the progress and success of a variety of catchment initiatives.[725] Local Nature Partnerships[726] have been provided with initial funding of £1 million.[727]

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[725] A fuller guide to the role of Local Nature Partnerships can be found in "An Overview of the Local Nature Partnership role" April, 2012 DEFRA: (http://www.archive.DEFRA.gov.uk/environment/natural/documents/local-nature-partnerships-overview120402.pdf)

[726] (http://www.DEFRA.gov.uk/environment/natural/whitepaper/local-nature-partnerships/)

Water Providers and Catchment Management

One way in which catchments can be improved is by working with the water utility providers. Ofwat has had a reputation of preventing providers increasing their expenditure on the surrounding catchment as they have in many instances deemed it not a proportionate use of the revenue gathered from the customer's bills. In certain instances some companies have provided catchment management services. Two companies in particular have made a conscientious effort to improve their catchment; Pennon (South West Water) and United Utilities.

United Utilities

The Sustainable Catchment Management Programme (SCAMP)

The Sustainable Catchment Management Programme (SCAMP) was designed for the sole purpose of the constant improvement of the catchment

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[727] (http://www.DEFRA.gov.uk/environment/natural/whitepaper/local-nature-partnerships/lnp-fund/). A full list of the partnerships can be found: (http://archive.DEFRA.gov.uk/environment/natural/documents/lnp-list-20120717.pdf)

within the region under the control of United Utilities the water and sewage provider for the North West of England.

Bryan Homan, Head of Catchment Operations, United Utilities said:

"SCAMP is an innovative long- term catchment management scheme that unites both private and public funding. It is showing early signs of success at improving raw water quality whilst providing a multitude of community and environmental benefits."[728]

The main purpose of SCAMP was to ensure biodiversity was being enhanced and maintaining a sustainable and environmentally friendly future for the agricultural tenants within the catchment. In turn this would improve the water quality.

SCAMP is happening in a massive area 20,000 ha and proportionately just over 1/3 of all of the land (56.385ha) which is owned by United Utilities.[729] In addition to this the two remaining estates owned by United Utilities are currently being considered for regeneration in 'Scamp 2'. Within the

[728] "The Natural Choice: Securing The Value of Nature" DEFRA (2011) : (http://www.DEFRA.gov.uk/environment/natural/whitepaper/)
[729] United Utilities Web: (http://corporate.unitedutilities.com/scamp-index.aspx)

catchment, United Utilities provide water and sewage services to 6.7 million customers, in addition to which the area has up to 30 million visitors per year as it is an area of great beauty and is popular for grouse shooting.[730]

SCAMP is not particularly needed in this specific location but it has developed due to several reasons. United Utilities had the foresight to integrate catchment management into their business plan. This in conjunction with governmental and non governmental support in the form of the tenant farmers, Natural England and the Royal Society for the Protection of Birds allowed SCAMP to evolve.

Over recent years industrial pollution, insufficient drainage, peat, wildfires and agricultural practices have all had a negative environmental impact, affecting the site. This has contributed to increased discolouration and pollution of water drawn from the catchment, which has to be removed through treatment processes. The process to purify the discoloured and polluted water is expensive. The reduction at source therefore benefits not only the catchment but the corporation.

[730] Valuing Environmental Impacts: Practical Guidelines for the Use of Value Transfer in Policy and Project Appraisal. Department for Environment, Food and Rural Affairs, February 2010

This was a partnership between United Utilities as the owner and primary funder (£8 million), their tenant farmers, Natural England[731], the Royal Society for Protection of Birds[732] and was endorsed by the Government who provided a grant of £2.7 million.

What has been Carried Out[733]

A variety of relatively simple measures have been carried out with the end goals being to; improve water colour, reduce soil erosion and reduce and remove pollution.[734]

The measures of improvement include:

A considerable amount of livestock has been relocated to allow the landscape to regenerate.

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[731] Natural England:
(http://www.naturalengland.org.uk/)

[732] Royal Society for the Protection of Birds:
(http://www.rspb.org.uk/)

[733] Information provided by the RSPB (Royal Society for the Protection of Birds) – which is one of the partners in the SCAMP Catchment Partnership:
(http://www.rspb.org.uk/ourwork/projects/details/218780-scamp-sustainable-catchment-management-programme#achievements)

[734] For more information including pictures of the improvement see:
United Utilities SCAMP Document
(http://www.britishecologicalsociety.org/documents/get_involved/SIG/Conservation/United_Utilities.pdf)

100 km of drainage has been improved

Areas of bare peat have been re-vegetated

Water courses have been fenced to decrease runoff.

Half a million deciduous trees have been planted on stream sides

(Visible Improvements)

SSSIs (Sites of Special Scientific Interest)

"*SSSIs are the country's very best wildlife and geological sites. They include some of our most spectacular and beautiful habitats - large wetlands teeming with waders and waterfowl, winding chalk rivers, gorse and heather-clad heath-lands, flower-rich meadows, windswept shingle beaches and remote uplands moorland and peat bog… It is essential to preserve our remaining natural heritage for future generations. Wildlife and geological features are under pressure from development, pollution, climate change and unsustainable land management*"[735]

[735] Sites of Special Scientific Interest Webpage (Natural England) (http://www.sssi.naturalengland.org.uk/Special/sssi/index.cfm)

Around 30% of United Utilities catchment is designated as an SSSI (Sites of Special Scientific Interest). One of the aims in establishing SCAMP was to aid the restoration of these areas. Currently over 95% of United Utilities SSSIs are now classed as in 'favourable' or 'unfavourable – recovering' condition. Which is a massive improvement (around 52%) since the management scheme was initiated. Before the programme was initiated the classification of the United Utilities SSSI was as follows[736]:

12% Favourable

36% Unfavourable & Recovering

29% Unfavourable & No Change

23% Unfavourable and Declining

In addition to this, or indeed as a result of this water quality has improved, particularly water colour has improved and there is less sediment in the water supply. The project although in the early stages has been hailed not only by United Utilities but also by DEFRA in the aforementioned White Paper as a success and an example of successful integrated Catchment Management.[737]

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[736] McGrath and Smith "Sustainable Management Catchment Project" From Hilltop to Tap. 9th National Hydrology Symposium, Durham, 2006 (http://www.hydrology.org.uk/Publications/durham/bhs_14.pdf)

[737] United Utilities, SCAMP, Executive Report, 2011: (http://www.naturalengland.org.uk/)

Comment

The SCAMP initative was the first nationally endorsed Integrated Catchment Management project. It was more than just a test it was an extensive experiment which included monitoring a large area of land and the injection of both considerable time and money.

The SCAMP project has at a Regional level developed what may one day become a National requirement. Importantly the elements which made the project work are cost efficient, simple and easy to duplicate.

One of the most important elements of the success is that the land was capable of restoration without constant human interaction, indeed it was the lack of interaction that emancipated the environment to regenerate itself. In addition many of the things that were done and what made a considerable difference to the environment were very simple. Planting, Leaving and Blocking[738]. These were the three main acts carried out in the restoration and management project. Importantly nature was shown to quickly restore

[738] Blocking is defined Below

damaged land and without constant supervision or support. Deciduous trees were planted and land was vacated. The process to restore the environment back to its original habitat was necessary but easy to replicate and it was not demanding or intensive in relation to constant maintenance or support. In addition to this drainage was also improved to decrease pollution and sediment from runoff. All of these techniques were effective and may be used in different ways country-wide.

Pennon (United Utilities)

South West Water in conjunction with United Utilities is a prime example of a company who has established a very successful catchment management Scheme. This successful partnership (between operator and catchment experts) was awarded both the 'Partnership Initiative of The Year' and the 'Community Project of The Year' (Water Industry Achievement Awards in 2012). [739]

South West Water have incorporated into their management, external non governmental bodies who essentially manage the catchment, the Rivers

[739] Water Industry Achievement Awards 2012: (http://www.waterindustryachievementawards.info/wiaa2012/2012-winners)

Trust being the primary organisation[740] with assistance from other non governmental organisations.[741] This project is aptly named, Upstream Thinking.

Upstream Thinking

"*Upstream Thinking brings multiple benefits extending far beyond regulatory compliance. This represents a revolutionary approach by the water industry and a departure from strict economic regulation for OFWAT, by allowing capital investment on third-party land, for the first time. It is a cost-effective and environmental approach to tackling long-term problems facing the water industry*."[742]

Upstream Thinking has been in operation for over five years. Its goal is to improve land management and in doing so increase the water quality and reduce treatment costs. The rationale being the strategy is that by improving the land management at source not only will the water quality and the

[740]The Rivers Trust:
(http://www.theriverstrust.org/)
[741] Which Include: The Wildlife Trusts of Cornwall and Devon. For a full list see:
(http://www.southwestwater.co.uk/index.cfm?articleid=8329)
[742] Upstream Thinking Webpage:
(http://www.exmoormires.org.uk/index.cfm?articleid=8692)

surrounding environment improve but the cost of treatment will be reduced. Martin Ross, Chief Manager of the Environmental Division at South West Water described the project during a personal interview with the author.

Martin Ross (South West Water)[743]

"*Environmental measures are still focused on specific parts of the environment. They focus on the control of sewage and abstraction from the rivers, on our service to customers. It does not look at a wider aspect, which should look at the river catchments. Each industry looks at environmental concerns independently and does not look at what other industries actually do, so most companies still think of an asset base and services to provide and the fact we need permission to do certain things - this is a one dimensional primitive water industry behaviour.*

We have external challenges including: drought, flooding, climate change, excessive runoff (phosphate and nitrate), hotter winters, algae problems (with warmer winter). Farming is more intensive and pollution has increased in the industry.

[743] Ross, Marin, South West Water, please see Appendix 1.

We need to have an alliance with the land management. Keep the fertilisers on the land not in the water!

Our brand is called Upstream Thinking, control the asset base and look at the wider environment.

The more the water is polluted the more expensive it is to treat.

Clear water will cost 20% less to clean. A lot of the chemicals now were waste chemicals, aluminium sulphate etc, very simple compounds are easy to clean, now you need more complex chemicals to deal with the more expensive fertilizers mainly made in Germany.

We need to take a wider view on management which will reduce pollution and save money.

If we look at the present day value, there is a huge value in investing in Catchment Management the benefit of 65 – to -1 at the moment. We have to stop thinking just about assets.

We need a three dimensional Water Management Model."

One of the reasons why South West Water has succeeded is in establishing an excellent working relationship with the Rivers Trust; in turn not only are South West appreciative of the assistance given by the Rivers Trust, but the feeling is mutual. The Rivers Trust clearly appreciates the ingenuity of South West in creating the partnership where other providers have not yet established such ties.

"*We have only recently engaged with the water industry. Previously the water companies have had no motive to aid Catchment Management. When water companies improve the catchment it will improve profit they are starting to realise this now…Martin Ross (Of Pennon/South West Water) is an example of where a company reaches out to assist catchments, other companies are not like this.*"[744]

What is advocated by both South West and The Rivers Trust are similar in that both consider holistic and community engagement at every stage of

[744] Ruggles –Brise, Archie, Rivers Trust, See Appendix 1

water provision. Such community involvement and land partnership as commented on within the Benson article are relatively new and it will take time to monitor fully but certainly where they have been carried out in locations such as the South West there have been visible improvements in water quality.

Action and Benefits

Ditch blocking is a key part of the catchment management. Essentially by blocking the ditches it results in the re-wetting of the catchment allowing for catchment restoration. The restoration occurs as bog grasses and mosses are enabled to grow through the extension of their habitat as the ditches are filled.

Not only does the increase in marshland aid the foraging of animals such as cattle, sheep and deer but it has a direct impact on humans.

As the ditches are blocked this increases the time for the water to filtrate through the ground and flow to the rivers and streams. This natural filtration

process results in less sediment and erosion and thus a cleaner, naturally filtrated water supply.

Keeping the moorland wet will help the environment as it retains moisture, so that during times of drought or climate change the environment would be less susceptible to a lack of expected rainfall or an increase in temperature.

The reduction in the rapidity of water flow means that at a corporate level expensive reservoir building and pumping can be avoided as the water supply is more constant. In addition the water that is supplied is purer and is therefore less expensive to treat.

In Exmoor alone 4,300 ditches have thus far been blocked, which stretches to over 50km of land. In addition Dartmoor and other areas under the control of South West Water are now being managed and ditches blocked.

Source Reduction

The at-source reduction in pollution is a vital and efficient way in which to increase catchment sustainability. Not only does at source reduction benefit

the land from which the pollution is created but it also benefits the environment and reduces costs for the water providers and in turn the customers.

"*We will reduce the impact of land management on water by ensuring that pollution and flood risk are addressed at source through targeted, risk-based enforcement of existing regulatory instruments and beyond this by identifying where land can be managed to deliver multiple benefits, including improving water quality, flood alleviation and biodiversity*."[745]

Marine

Marine initiatives are also vitally important for the general wellbeing of the animals and humans that inhabit costal regions and in addition to the water, which runs to and from the sea. This is another area where DEFRA is focusing to improve the environment:

"*Much has been done in recent years to protect our seas and marine resources, and the state of the UK seas is improving. Through the Marine*

[745] "The Natural Choice: Securing The Value of Nature" DEFRA (2011) : (http://www.DEFRA.gov.uk/environment/natural/whitepaper/)

and Coastal Access Act 2009, our seas have become a global exemplar of marine conservation. We are leading the world in developing a marine planning system and in encouraging socioeconomic activities such as fishing to be seen as part of the solution to the environmental challenges that our seas face. However, there is still much to be done to achieve our vision. The Government is committed to achieving good environmental status across England's marine area, working in partnership with those who use, enjoy and derive their income from the marine environment."[746]

"*We are committed to an ecosystems approach to management in the marine environment, ensuring that marine resources are used sustainably and are managed in an integrated and holistic way."*[747]

Flooding

Flooding is a national problem in England and Wales. It is clearly an issue which has an impact on large parts of England and Wales and must be

[746] "The Natural Choice: Securing The Value of Nature" DEFRA (2011) : (http://www.DEFRA.gov.uk/environment/natural/whitepaper/)
[747] "The Natural Choice: Securing The Value of Nature" DEFRA (2011) : (http://www.DEFRA.gov.uk/environment/natural/whitepaper/)

addressed. The problems with flash floods (and droughts) are discussed in the next chapter.

"*More than 5 million people live and work in 2.4 million properties that are at risk of flooding from rivers or the sea, one million of which are also at risk of surface water flooding. A further 2.8 million properties are susceptible to surface water flooding alone.*"-[748]

Catchment Flood Management Plans[749]

Flooding[750] although previously considered a separate issue from catchment management is becoming more and more frequent.

The way in which pollution has been viewed also needs to change as it is not just a problem created by and dealt with those in agricultural industries.

[748]Flooding in England, A National Assesment of Flood Risk, Environment Agency, 2009:
http://publications.environment-agency.gov.uk/PDF/GEHO0609BQDS-E-E.pdf
[749] (http://www.environment-agency.gov.uk/research/planning/33586.aspx)
[750] Governed by the : Flood and Water Management Act 2010:
http://www.legislation.gov.uk/ukpga/2010/29/pdfs/ukpga_20100029_en.pdf

"*Agriculture is a significant source of diffuse pollution but it is not the only one; other sources include products used in the home, sewer misconnections and run off from roads. We will develop a strategy to identify and address the most significant diffuse sources of water pollution from non-agricultural sources*."

Flooding is currently controlled by the EA and Local Authorities and Local Council administration.

Although the Government and Local Authorities have made improvements to flood defences the mass floods in November 2012 showed the vulnerability of England and Wales to flooding where over 800 homes were flooded.[751] It is not a direct facet of water provision, but the Government in the future must improve flooding control if it wishes to improve the environment and reduce pollution.[752]

[751] "*Floods in the UK, more Than 800 Homes Flooded as Storm Hits*." BBC News, 26 November 2012:
(http://www.bbc.co.uk/news/uk-20488645)
[752] The BBC Flood Map shows the severity of the November 2012 Floods:
(http://www.bbc.co.uk/news/uk-19717539)

Optimism

If the White Paper is to believed then there will be a continued improvement to both the environment and the quality of water.

"*By 2050, water bodies will be in excellent health, with reduction in pollution (nutrients, sediments, chemicals and bacteria). They will sustain rich and abundant wildlife appropriate to their location and will be as resilient as possible to climate change. Water environments will be safe and attractive, supporting a wide range of sustainable uses, including leisure and recreation.*"[753]

It was clear from the White Paper that in terms of sustainable provision there were considerable obstacles, which needed to be overcome. At an individual analytical level it was possible for one to look at improvements in isolated fields such as drinking water quality and beach or lake water quality and state that improvements were being made and the system of management was progressing. Further progress however was and is needed

[753] "The Natural Choice: Securing The Value of Nature" DEFRA (2011) : (http://www.DEFRA.gov.uk/environment/natural/whitepaper/)

in the gaps of the provision including the Catchment Management system and improvements are now being made.

Progress since Implementation - Analysis

(From publication to late 2012 there were four published updates: October 2011[754], January 2012[755] April 2012[756] and July 2012[757].)

Funding Approval

Funding has always been an area of great concern and little resources. The transfer from private to public sector has left certain gaps in the operational management of the Catchment.

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[754] "*Natural Environment White paper Implementation Update" Her Majesty's Government,* October, 2011: (http://archive.DEFRA.gov.uk/environment/natural/documents/newp-imp-update-111013.pdf)

[755] "*Natural Environment White paper Implementation Update" Her Majesty's Government,* January, 2012: (http://archive.DEFRA.gov.uk/environment/natural/documents/newp-imp-update-120131.pdf)

[756] "*Natural Environment White paper Implementation Update" Her Majesty's Government,* April, 2012: (http://archive.DEFRA.gov.uk/environment/natural/documents/newp-imp-update-120424.pdf)

[757] "*Natural Environment White paper Implementation Update" Her Majesty's Government,* July, 2012: (http://archive.DEFRA.gov.uk/environment/natural/documents/newp-imp-update-20120717.pdf)

Ofwat has approved a spend of £9.1 million. Ofwat essentially must approve the spend of each provider. Funding approval is obviously very important and shall be discussed with Ofwat's role in sustainability later in the Thesis . This amount has been allotted to catchment 'clean up'.

" *This will be used to support our objective of coherent and resilient ecological networks through actions to restore habitats tackle diffuse pollution from rural and urban sources, pollution from metal mines and address invasive non-native species. The Environment Agency and Natural England will work in partnership with civil society organisations such as Rivers Trusts. It is expected that over 800 water bodies will be improved and that benefits of around £600 million will be secured*." [758]

Not only is £92 million a large amount, (considering the major cost is manual labour) but importantly the financial benefits of that investment is estimated to be returned six-fold to £600 million.

[758] "The Natural Choice: Securing The Value of Nature" DEFRA (2011) : (http://www.DEFRA.gov.uk/environment/natural/whitepaper/)

The way in which DEFRA have chosen to implement this is also very important as they have incorporated external experts who are committed to improving catchments such as the Rivers Trusts. This ground level expert support combined with governmental funding and support is a key principle and proposed development of many industry leaders which DEFRA have incorporated into their plans.

In addition other funding is being allocated such as:

£18 million (per annum) to the Catchment Sensitive Farming Initiative.[759]

Twelve new Nature Improvement Areas will be established and funded with £7.5 million.[760]

£1.2 million to the National Biodiversity Network

[759] For more information on Catchment Sensitive farming and what it entails see the below link from Natural England – In particular its 'Guide to Catchment Sensitive Farming):
(http://publications.naturalengland.org.uk/publication/30033?category=45002)

[760] More information on NIAs, and where they will be established can be found on the DEFRA webpage:
http://www.DEFRA.gov.uk/news/2012/02/27/nature_improvement_area/)

Catchment Partnerships

Various different programmes incorporating all sectors of the catchment have been included.

" *We are establishing ten catchment-level partnerships to develop and implement plans for creating and maintaining healthy water bodies. We will also support additional groups who wish to take a lead in trialing a catchment approach. The pilots will establish the right level of spatial targeting to address sources of water pollution and explore the most effective ways to engage partners. The pilots will also aim to establish how best to achieve integrated, multiple environmental outcomes.*"

One example of a catchment programme is as aforementioned the Local Nature Partnership Initiative.

Local Nature Partnerships

By October 2012 since the White Paper was published 48 Local Nature Partnerships were officially established.[761] Local Nature Partnerships were devised to help the local area manage the environment by creating a partnership between the government and a variety of stakeholders including organisations, individuals and businesses.

The role and objectives of Local Nature Partnerships have been documented and published by DEFRA in April of 2012.[762]

The summarised purpose has been broken into three main areas:

"Drive positive change in the local natural environment, taking a strategic view of the challenges and opportunities involved and identifying ways to manage it as a system for the benefit of nature, people and the economy…

[761] List of Local Nature Partnerships as of October 2012: (http://archive.DEFRA.gov.uk/environment/natural/documents/lnp-list-contacts.pdf)
[762] "*An Overview of the Local Nature Partnership's Role*" DEFRA April 2012: (http://www.archive.DEFRA.gov.uk/environment/natural/documents/local-nature-partnerships-overview120402.pdf)

Contribute to achieving the Government's national environmental objectives locally, including the identification of local ecological networks, alongside addressing local priorities…

Become local champions influencing decision-making relating to the natural environment and its value to social and economic outcomes, in particular, through working closely with Local Authorities, Local Enterprise Partnerships (LEPs) and Health and Wellbeing Boards."[763]

At a local level one of the main concerns was that the community were not contributing enough to the way in which the environment was being managed by the Government. The concept of the Local Nature Partnership and the expediency in which they have been formed is admirable. It is however too early to monitor their efficiency in practice but the concept in theory is sound.[764]

[763] DEFRA Webpage: (http://www.DEFRA.gov.uk/environment/natural/whitepaper/local-nature-partnerships/)
[764] For more information on the progress since the White Paper in relation see: (http://www.DEFRA.gov.uk/environment/natural/whitepaper/one-year-on/)

Comment

The concept that individuals and the community have an impact on their catchment is a valiant one. The industry and action groups such as the Rivers Trust have been calling for changes and improvements in Catchment Management for a considerable time and it has been widely proposed that community level management was the best.

Local Nature Partnerships as a concept and the interaction between individual communities and Government is the initial step towards a successful and fully integrated Catchment Management System.

It would be easy to be critical and negative towards the lack of specificity towards the project but it must be considered that this is a new system, which has been developed at the bequest of various stakeholders. The fact that ground-up community interaction is being incorporated at a national level is both desired and needed. As opposed to the natural reaction of which Britons are renowned, criticism should be kept at bay and energy should be expended on how to develop a sound concept.

Nature Improvement Areas

In addition twelve new Nature Improvement Areas (NIA) were awarded NIA status and will share funding of £ 7.5 Million plus an additional £750,000 was given to those areas who narrowly missed out on being awarded NIA status.

Nature Improvement Areas vary their role to fit the environment, but in general they are established to improve the ecology of the nature and wildlife in the designated area.

This is hoped to be done through a voluntary partnership between governmental organisations (including The Forestry Commission and Natural England) and national bodies. These new partnerships hope not only to mitigate the changes through future global warming but to improve the environment and the ecology and biodiversity of the site.[765]

[765] More Information on NIA can be found as documented by DEFRA: (http://www.DEFRA.gov.uk/environment/natural/whitepaper/nia/)

Advice from Stakeholders

In addition to incorporating stakeholders into projects such as Nature Improvement Areas and Local Nature Partnerships the Government have been collecting information from farmers and land managers since the publication of the White Paper and will continue to do so until 2013 when a Report on this information is planned to be published and then incorporated into a framework for development.[766]

Environmental Stewardship

Environmental Stewardship is an initiative, which enables landowners and farm managers to deliver effective land management through government funding information and advice.[767] This good management of land helps the stewards do many things including reducing the toxicity levels and amount of toxic runoff into waterways.

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[766] "*Natural Environment White paper Implementation Update" Her Majesty's Government,* July, 2012: (http://archive.DEFRA.gov.uk/environment/natural/documents/newp-imp-update-20120717.pdf)

[767] For More Information See Natural England Webpage: (http://www.naturalengland.org.uk/ourwork/farming/funding/es/default.aspx)

From January 2013 a new form of environmental stewardships at a more entry level will be introduced partly as a response to the publication to the White Paper in an attempt to improve the environment. These new levels will mean that individuals will be able to gain support from doing more minor improvements which cumulatively will have a major impact on the country's natural wellbeing. Importantly for water one of the new options (Hedgerow Restoration) is important for the hydrological cycle in water retention and purification.[768]

Forestry

In 2011 the Government proposed to privatise many of the forests making then move from public owned governmentally owned areas to private. There was a huge national backlash and the Government subsequently reconsidered their position.

The forest is of vital importance to the storing and cleansing of water, the biodiversity of the country and the life which it fosters. An independent panel on forestry was established and a report published in 2012, which advocated that the forest currently owned publicly should remain in the

[768] Fore More information on the new options for Stewardship see: (http://www.naturalengland.org.uk/ourwork/farming/funding/es/mesmefeature.aspx)

public sector. It also highlighted that although the forest owned by the public sector only amounts to 18% of the forest areas in Britain this proportion is over one third of woodland in active management and over 40% of the woodland access across the country, to which the public has access.[769]

The change in government direction and the fact that they considered the opinions of the public and the independent report in deciding to keep the forest and woodlands in public ownership and government control shows not only the strength of the public's voice and their affinity with the forest, but also that the Government either needed or wanted to change their policy after their voice was heard.

In addition to the forests and woodlands, soil has also been a topic for analysis. The restoration of peat bogs is now considered one way in which to improve wetlands and in doing so improve the catchment and its water.

[769] Independent Panel on Forestry, Final Report, DEFRA, 2012 (http://www.DEFRA.gov.uk/forestrypanel/files/Independent-Panel-on-Forestry-Final-Report1.pdf)

An Interim Report was published in March of 2012[770] stating the progress made and to be made in the future.

Catchment Restoration

Catchment improvement, management and restoration was seen as an area of improvement in the Natural Environment White Paper. As a response to this and through demands from various stakeholders and interested parties the Government established a Catchment Restoration Fund.

The aim of the Fund is to improve the landscape through which water flows. The Environment Agency is administering the Fund's reserves to third sector groups who apply to the Government for funding.

The hope is to restore catchments and watercourses, reduce the impact of man made structures and farming on watercourses and to reduce the factors of pollution.

[770]Sustainable Growing "Interim Report" DEFRA, March, 2012 (http://www.DEFRA.gov.uk/peat-taskforce/files/SGMTF-Interim-Report1.pdf)

The considerable amount of £28 million has been allocated for the years 2012 – 15. Since the introduction of the proposed catchment schemes, 131 applications were received by the government from a variety of parties.[771] Many of the parties were Rivers Trusts and Wildlife Trusts.

This investment in catchments through third party resources, using government funding is exactly the result that was called for and needed. Many organisations had the resources which the government needed but did not utilise. These new projects hope to join those resources to Government aid and indeed funding. David Baxter from the Environments Agency for Catchment Management said;

"The CRF is focused on water, but, where possible, connections to a wider range of benefits are being supported. A lot of the projects it funds are about restoring natural connections along rivers (removing barriers) and between the rivers and their landscape (restoring habitats). The fund allows charities to connect local people and businesses to actions they can take to improve their environment. Because it's about catchments, it connects

[771] The successful parties are;
(http://www.environment-agency.gov.uk/static/documents/Research/CRF_successful_bids_2012.pdf)

farmers and businesses to the impacts their land use has on the water environment. And it connects up existing actions at a catchment scale, so that they have greater effect."[772]

Catchment Pilots

Twenty five Catchment Pilots and 41 additional Water Based Initiatives since 2011 have been founded.[773]

These pilots were stated by the Minister for the Natural Environment and Fisheries to '*Provide a clear understanding of the issues in the catchment, involve local communities in decision-making by sharing evidence, listening to their ideas, working out priorities for action and seeking to deliver integrated actions that address local issues in a cost effective way and protect local resources.*'[774]

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[772] Environment Agency Webpage:
(http://www.environment-agency.gov.uk/research/planning/136182.aspx)
[773] Catchment Map, DEFRA, 2012:
(http://www.environment-agency.gov.uk/static/documents/Research/catchment_based_approach.pdf)
Also:
(http://www.environment-agency.gov.uk/static/documents/Research/Water_Framework_Directive_Management_Catchments.pdf)
[774] DEFRA Webpage:

The Catchment Pilots are attempting to integrate a variety of stakeholders into the sustainable use of the catchment and its water supply. This integration was seen in the White Paper to be sorely lacking.

By incorporating a variety of participants across the catchment the aim is not only to learn from a variety of different sources, but to positively make a difference to the improvement of the catchment. It is hoped that these improvements will take the form of a range of environmental improvements. Involvement in a broader community will also enable the prioritisation of key community and catchment issues.

Non governmental participation is a key element of the Catchment Pilots and includes; individuals, families, voluntary organisations, wildlife groups, Natural England, the Countryside Alliance, the Woodlands Trust, the private provider (Water Company) and many more depending on the locality and the interested parties.

(http://www.environment-agency.gov.uk/research/planning/131506.aspx)

The key elements which make these Pilots different is not only in incorporating a variety of stakeholders but also that they are region and location specific as can be shown from the below examples:

Catchment Pilot Examples

The Catchment Pilot in the River Leam[775] hopes to reduce the high levels of pesticides, phosphates and other chemicals in the river. The toxicity is results from discharge by both domestic and industrial sources ranging from domestic detergent to agricultural runoff.

The Pilot has gathered over fourteen bodies to cooperate and work towards catchment improvement.

Excess phosphates is a relatively common concern in many catchment areas as it is bad for the water and indeed the fish in the water. The Ecclesbourne Valley Catchment Pilot is another Catchment which is hoping to reduce the

[775] (http://www.environment-agency.gov.uk/research/planning/144137.aspx)

phosphate in the water supply and is working with a variety of stakeholders including Severn Trent Water to reduce this.[776]

Every Catchment has its own needs and a variety of different contributing stakeholders. Other Examples include: Andur and Ouse[777], Irwell[778], Lower Lee[779], Lower Wear[780] and Upper Tone[781]

Significant amounts of funding are now being spent by the Government in Catchment Management. Ofwat is still however the controller of how much is spent at a corporate level by providers.

[776] See DEFRA Webpage: (http://www.environment-agency.gov.uk/research/planning/139235.aspx)
[777] (http://www.environment-agency.gov.uk/research/planning/135096.aspx)
[778] (http://www.environment-agency.gov.uk/research/planning/136677.aspx)
[779] (http://www.environment-agency.gov.uk/research/planning/138046.aspx)
[780] (http://www.environment-agency.gov.uk/research/planning/137414.aspx)
[781] (http://www.environment-agency.gov.uk/research/planning/138031.aspx)

Part 2

Ofwat and Sustainable Development through Catchment Management

Ofwat has a published a Sustainable Development Strategy[782]. It also has been directed by Government through the Secretary of State and by legislation of the importance of the sustainability of the environment and sustainable water provision. Indeed it has a statutory duty to contribute to sustainable development.[783] Sustainable use of water is one of the most important areas of water provision and Ofwat along with the other regulators should keep this at the forefront of their decisions.

"Ofwat's work can have significant social and environmental impacts. Ofwat has a duty to exercise its powers and duties in a way best calculated to contribute to the achievement of sustainable development. It is therefore expected to consider social and environmental outcomes in their broadest

[782] '*Delivering Sustainable Water Ofwat's Strategy*, OFWAT, 2010: (http://www.Ofwat.gov.uk/aboutOfwat/reports/forwardprogrammes/rpt_fwd_20100303Ofwatstrategy.pdf)
[783] "*Water Today, Water Tomorrow – Ofwat and Sustainability*." OFWAT 2009

sense…..As part of its approach to sustainable development, Ofwat should encourage companies to look at their own operations and performance."[784]

In 2011 an independent review was led to scrutinise the nature and efficiency of Ofwat.[785] The Review on the whole was positive towards Ofwat. David Gray was asked by the Government to draft an independent review of Ofwat. The review considered Ofwat's responsibilities and to what extent it carried out its duties efficiently. The Review was generally very positive towards Ofwat. "Ofwat *has contributed to significant achievements in the water sector since it was established in 1989. In that period the industry has invested some £90 Billion and has achieved substantial improvements in water and environmental quality. The stability and predictability of the regulatory regime have facilitated the financing of this investment while Ofwat's efforts to improve efficiency in the sector have significantly reduced the impact on consumers through higher charges*."[786]

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[784]Statutory Social and Environmental Guidance to the Water Services Regulation Authority (OFWAT), August , 2008: (http://archive.DEFRA.gov.uk/environment/quality/water/industry/review/documents/Ofwat-guidance080922.pdf)

[785] DEFRA Webpage: (http://www.DEFRA.gov.uk/news/2011/07/06/review-of-Ofwat-published/)

[786] "*Review of OFWAT and The Consumer Representation in The Water Sector"* DEFRA, 2011: http://www.DEFRA.gov.uk/publications/files/Ofwat-review-2011.pdf

Areas which were highlighted, were Ofwat's role in Sustainable Management and Catchment Management.

Sustainable Development through Catchment Management

"*The only area in which we heard any significant call for change was in relation to the status of its secondary duty to contribute to the achievement of sustainable development. In our interim findings, we set out several issues which respondents had identified as evidence that Ofwat's approach was not leading to sustainable outcomes, particularly over the longer-term.*

These Include:

The five-year regulatory cycle, driving a focus on the short-term rather than a consideration of the longer-term requirements and obligations of the sector.

A bias towards capital investment solutions including lack of support for catchment based approaches and preference for end of pipe solutions;

Concerns about the lack of incentives for innovation were raised in responses to our call for evidence both in general terms, in the sense that the regime is seen as suppressing R&D activity, and in particular in relation to Ofwat's approach to particular issues such as Catchment Management schemes.

The general issue of spending on R&D applies to any regime imposing strong incentives for efficiency in operating costs. In such a regime companies will tend to see R&D expenditure as an easy area in which to cut costs, particularly if there is no strong driver for innovation at the time or if the potential returns are not clear……..The more specific point relating to Catchment Management schemes seems to be part of a rather different issue. The question here is whether the companies are sufficiently flexible and imaginative in considering their available options and whether the regulatory regime incentivises them to be. In this case it seems likely that the regime does have an inhibiting effect, resulting in the degree of caution we observe in the companies in their approach to the regulator and the regulatory regime."

The key problem here is that Catchment Management is seen by Ofwat as a

duty of the providers but the providers are not allowed to treat Catchment Management as a principal priority, as in the short term Ofwat deem that the financial return to the customer would not counterbalance the amount of time or money spent on the Catchment by the provider.

Thus there remains a situation where Catchment Management is seen by Ofwat as a 'Secondary Duty'. Leakages for example would be seen as a "Primary" duty and expenditure by a provider to prevent or stop leakages would be ascertained to be a viable expense and thus the resulting costs (if deemed appropriate) may be passed in a (possible) increase of customer bills. Catchment Management has not been given such priority and thus many companies have not been able (not willing) to contribute to Catchment Management and Development, but such spending may have (and has) been seen as inappropriate. Such inappropriate spending could result in either Ofwat not approving a corporate spending plan, or in corresponding customer price rises which related to Catchment Management.

The way in which this could be resolved would be to escalate the importance and empower future spending by Ofwat on Catchment Management by making Catchment Management a Primary Duty. This however was not the

conclusion of the Independent Report:

Report Recommendation

"*We acknowledge the concern of some stakeholders that Ofwat does not do enough to fulfil this duty [In relation to contributing to sustainable development] , but we are not persuaded that elevating its status in the hierarchy of duties would have the effect that these stakeholders seek…*

Recommendation 13: Ofwat's duty to contribute to the achievement of sustainable development should remain, as a secondary duty, in its current form.

Ofwat has a secondary duty under the Water Industry Act 1991 (as amended) to exercise and perform its powers and duties in the manner it considers is best calculated to contribute to the achievement of sustainable development.

Many respondents argued that the companies have an incentive to pursue capital investment schemes, rather than potential alternatives, in order to enjoy the long-term return on the resulting addition to Regulatory Capital Value (RCV). The companies generally accept there is some truth to that view but also express a concern that they cannot rely on not being penalised for inefficiency if they choose solutions involving operating costs rather than investment – therefore they tend to prefer to invest.

The other regulators have clear roles in implementing and enforcing the quality and environmental aspects. An economic regulator, focussed on protecting the consumer interest in this respect, seems to provide an appropriate balance of powers and responsibilities. Ofwat's approach to this in seeking to ensure that sustainable outcomes are delivered as efficiently as possible also seems broadly appropriate. There are areas of friction between the various organisations but the balance appears about right.

The question therefore is how the commitment to sustainable development is turned into individual regulatory policies and decisions. The essence of many of the criticisms that we have heard seems to be that, at the decision

stage, Ofwat is driven too much by a desire to introduce market mechanisms and by cost-benefit analysis which focuses on the ratio of quantified benefits to quantified costs, and does not take into account the unquantifiable benefits considered under a broader impact assessment and the longer-term policy goals these might contribute to. Ofwat might usefully consider whether it properly takes such wider impacts into account in its analyses. There are other possible approaches that could potentially improve the position. Government could be more specific in its guidance to Ofwat as to how it should interpret its sustainable development duty. Guidance does not have statutory force but the regulator must have regard to it and the more clearly the guidance is expressed, the more likely it is to have effect.

Another approach could be for Ofwat to undertake a review of its interpretation of its sustainable development duty and look for areas where its emphasis may be inappropriate. Both of these ideas seem to us to have merit and seem more proportionate than to introduce another primary duty."

Comment on Recommendations

These recommendations have fundamentally missed the main concern of companies who wish to spend money on Sustainable Development and Catchment Management.

"Ofwat's principal role is to do with prices. In the future it will have to consider the long-term sustainability of services.

We have got to have a long-term focus on the provision of resources.

Ofwat will have to shift, so that things are being delivered in a long term way… In the future Ofwat will have to recognise the sustainable solutions."[787]

[787] Interview with Colin Skellett, Wessex Water Services, See Appendix 1

By law each provider must have a management plan,[788] but the use of this plan is severely restricted by what they are permitted to allocate pecuniary resources towards.

The Report states ". *The essence of many of the criticisms that we have heard seems to be that, at the decision stage, Ofwat is driven too much by a desire to introduce market mechanisms and by cost-benefit analysis which focuses on the ratio of quantified benefits to quantified costs, and does not take into account the unquantifiable benefits considered under a broader impact assessment and the longer-term policy goals these might contribute to. Ofwat might usefully consider whether it properly takes such wider impacts into account in its analyses."* Then goes on to say that this would be resolved by either Government Guidance or a Review. The Report admits that corporations have restricted themselves in progressing catchment management stating that the main factor is the probable discerning view of Ofwat and potential repercussions. The Report does not however give viable solutions.

[788] The Corporate Plans Can be seen: (http://www.environment-agency.gov.uk/research/planning/33106.aspx)

The solution is obviously to increase the priority of Catchment Management to a Primary Aim of the corporations. This would result in catchments being protected and restored and as has been proved by those corporations who have actively incorporated catchment management in to their corporate plan that indeed the water quality improves, which results in less necessary expenditure in water purification which means not only reduced customer prices but increased profits.

As Ofwat has itself stated everything is observed through a '*prism of cost*'. *"We will not stop a benefit if it outweighs a cost. It is easy for people to say Ofwat is stopping us, this is not the case, if so then the business case has not been made, the cost benefits are not right… We absolutely consider environmental issues, but through the prism of cost."*[789]

Martin Ross South West Water [790]

South West Water has for many years been a national leader and champion of Catchment Management which has seen their purification costs drop and their catchments improve.

[789] Interview with David Hackett, OFWAT, See Appendix 1
[790] Ross Martin, South West Water (Pennon) Full Interview can be seen in Appendix 1

"*We have got a business where catchment must be taken into consideration and we do that.*

The ten million pounds spent [By South West Water] up to 2015 adds only 65 pence to the bills of customers – and this improves the catchment of the supply.

Previously we had the old approach, we would state to Ofwat, you need to give us this money for catchment development, if not we will go to Competition Commission. It is juvenile it is like your parent isn't giving you pocket money, we now need and have a more mature approach. We share in an attractive way with Ofwat, to say yes we want to be part of this and yes you can raise the money.

We know nothing about certain types of management, but the Rivers Trust do and so we use and fund them.

The Rivers Trust can focus on the management of the catchment and we can be their sponsors.

Catchment sensitive farming is running a year at a time. Catchment Management has to run for 20 or 30 years for this to get a result.

There is a shortage of funding, but a long term sustainable catchment is more financially viable.

Landowners and companies using a trustee as an intermediary such as the Rivers Trust is the way forward.

You can educate farmers on:

Application rates

Weather implications

How weather has an impact on the business

Holistic Management

Simple, but effective models.

Why isn't everyone doing this? Some are!

In Wessex in over 80% of boreholes they have appointed their catchment officers.

United Utilities is doing it to recover Moorland from acid rain….."

South West Water have done what most other providers have not done in spending considerable amounts on Catchment Management. They have done this through integrating other third party stakeholders such as the Rivers Trust.

This concepts of third party integration and Catchment Management is similar to the new governmental schemes that were discussed previously in the Thesis which incorporate various stakeholders into a process which enables those stakeholders to facilitate catchment management with the aid of Governmental financial resources.

What Martin Ross called for was a holistic incorporation of the catchement and a variety of managers. South West have built up a very good relationship with Ofwat and have persuaded them that this form of spending is efficient and necessary. Most of the other providers have not done this. There would be two ways to incorporate this type of thinking into each provider, one would be to persuade each individual provider to come up with similar proposals to that of South West Water and then persuade Ofwat that those projects were needed in their water catchment.

The alternative would be to elevate the duty of Sustainable Development and catchment management to a Primary duty of the providers. This would mean that not only would there be so much resistance by Ofwat towards catchment management proposals but corporate providers consider catchment management a high priority, indeed potentially if they did not invest enough time or effort into catchment management they may potentially be fined by Ofwat

Additional Needed Improvements

In addition to the above the Independent Report highlighted two areas where they thought that Ofwat needs to improve.

"*There are two main areas in which we would like to see changes in the way that Ofwat behaves. First, Ofwat needs to engage more constructively and effectively with the full range of stakeholders in the sector and be more transparent in its decision making. Secondly, it needs to reduce the burden of regulation on the companies to encourage them to be more flexible and innovative in their approach.*

We heard widespread concern about Ofwat's approach to consultation and engagement, suggesting that Ofwat does not take the views of others properly into account and that the reasons for its decisions are often not clear. We also saw evidence of a lack of trust between Ofwat and the companies it regulates….We found a clear consensus that the burden imposed on the companies by the regulatory regime is excessive and needs

to be reduced. This is important in its own right but the problem goes further than just the scale and cost of the regime. We saw considerable evidence to suggest that Ofwat goes too far into the detail of company business plans and that, as a result, the companies are very Ofwat focussed and very cautious."

Stakeholder Engagement

"Stakeholder engagement was never part of Ofwat's remit as they were initially established as an organisation with a specific role which related to the monitoring of price and company finances. This is however an admirable suggestion as Stakeholders who are more connected with the needs of the land and the water have a completely different perspective to what is needed to those who are based in an office in London."

Reducing the Burden

The criticism which relates to the burden on companies needs to be more specific. Ofwat was criticised for going '*too far into the detail of company business plans and that, as a result, the companies are very Ofwat -focussed*

and very cautious'. Ofwat is the regulator which monitors the provision of water to the entire country, being overly rigorous should certainly not be seen as a criticism. Would the objective of any regulator monitoring the provision of water through the private sector not aim to ensure that those providers were indeed '*cautious*'. It has a dedicated and educated workforce who are competent enough to be commercially rigorous. It is evident that corporations of any nature like to keep their workings and indeed their finances as closed to third parties as possible. Had there been such stringent (global) regulation monitoring the banking sector it is unlikely that the banking crisis would have occurred.

A different criticism would be that Ofwat should change the way in which it allows corporations to prioritise. For example if Catchment Management was elevated to a Primary Duty of the providers then the criticism towards spending on such matters would duly be reduced. The detailed way in which Ofwat meticulously analyses the companies although unpopular is a fundamental block on which the efficient and effective provision of the Water Industry in England and Wales stands.

Conclusion

Catchment management and partnerships in various form with land owners are becoming more and more important to both the providers of water and the owners of land. DEFRA has recognised that more is required to have better systems of holistic catchment management. Companies such as United Utilities and South West Water have recognised that it is in their interest to proactively encourage multilevel partnerships between landowners and water providers. Sustainability is a concern which a country usually addresses once the other factors of provision have been satisfied, for example it is not a concern to incorporate into a country which cant even provide fresh water to its inhabitants. Sustainability is however an important issue to address and it is an ever moving target which countries must try and improve as much as they can. Great Britain has lots to improve on, but importantly bodies such as DEFRA have recognised that improvements were and are needed and the improvements have begun. In the future this work urges that Ofwat allows catchment management to become a 'Primary Duty' for corporate providers so that they can invest more time and financial resources in the future.

Chapter 8

The Future of Water

Introduction

Part 1 of this chapter discusses several water related problems affecting Great Britain, which are related to climatic changes including the impact of flooding and drought.

Part 2 of this chapter deals with global future concerns relating to water, which have not already been examined in the beginning of the Thesis. From this the possible future changes relating to water will also be discussed.

Part 3 determines what global water provision could learn from the systems in England and Wales. In addition there are concluding remarks.

Part 1

Recent Water related Problems in Great Britain.

England and Wales Suffer Drought

Drought is not a term one would usually associate with Britain however there have been several droughts over recent decades notably in 1995, 2003 and 2012. Every drought is unique and has specific factors however broad categories of drought can be defined; "*meteorological droughts, defined essentially on the basis of rainfall deficiency, hydrological droughts where accumulated shortfalls in runoff or aquifer recharge are of primary importance, and agricultural droughts where the availability of soil water through the growing season is the critical factor*"[791].

Although the way in which the water is distributed as shown can vary and alter the way in which drought is categorised it also means that one area may be in drought (such as Yorkshire in 1995) when other areas of the same landmass are not, such as in Scotland, its contiguous neighbour. Generally

[791] Marsh Terry, "*The UK Drought of 2003 –an overview" Weather, Vol 59 No 8 , 2004: (http://www.nerc-wallingford.ac.uk/ih/nrfa/yb/yb2003/drought2003/index.html#table1)*

however, where there have been British droughts this has been from a lower than average rainfall which can be shown at a national level. In 1921 there was for example only 520 mm of rainfall, which is 68% of the average rainfall and in 2003 there was only 546 mm which was only 72% of the average rainfall.[792]

In an average year some parts of England including Kent and Oxfordshire have the same per capita water availability of Tunisia. The professionals are professing that this situation is only going to deteriorate. The Met Office[793] has estimated that rainfall could decrease by one fifth by 2050. This will be exacerbated by the fact that the population in England is estimated to grow by ten million by 2035.[794]

The Yorkshire Drought of 1995

In 1995 during a hot summer of 1995 Yorkshire experienced a severe drought. This drought caused the introduction of measures across the region

[792] Marsh Terry, "*The UK Drought of 2003 –an overview" Weather, Vol 59 No 8 , 2004: (http://www.nerc-wallingford.ac.uk/ih/nrfa/yb/yb2003/drought2003/index.html#table1)*
[793] The Met Office (originally an abbreviation for Meteorological Office but now the official name itself) is the Weather Service for the United Kingdom: (http://www.metoffice.gov.uk/weather/)
[794] "*England's Drought: Will the taps run dry*?" The Week, 25 February 2012

to prevent a crisis ranging from hosepipe bans to emergency extractions from local rivers. This was the largest challenge which privatisation had faced since its inauguration.

The drought, governed under private ownership as opposed to public ownership was caused not by the fact that there had been a privatisation of the infrastructure. It was caused by a variety of factors the main one being the unusually low rainfall and the abnormal amount of hot days. In 1995 there were 26 hot days. Hot days are recorded as a day having a daily mean temperature of above 20 °C. These 26 days were the largest number recorded in the 20th Century.[795]

The safeguards within water companies and the management approach to those safeguards was seen to be lacking not just in Yorkshire Water but in the industry as a whole and these inefficiencies were tackled by Ofwat and in turn the water providers.[796] After the drought the Department of Environment Transport and Regions (DETR) together with representatives

[795] Palutikof et al, "*Public Perceptions of Unusually warm weather in the UK: impacts, responses and adaptations*" Climate Research Vol 26, 2004: (http://www.ottokinne.de/articles/cr2004/26/c026p043.pdf)
[796] Bakker Karen, "*Privatising Water, Producing Scarcity: The Yorkshire Drought of 1995.*"Economic Geography, Volume 76, No 1 , 2000

from the major water suppliers devised and published an action plan called 'Water Resources and Supply: Agenda for Action'[797] The agenda which combined both the knowledge of both the Government in the form of the Environment Agency and Private Sector produced estimations of water demand over the next 25 years incorporating various factors including Climate Change. After this the Environment Agency issued its Water Resource Planning Guideline in 1997,[798] since then the Environment Agency has continued to publish such guidelines the most recent being published in 2011.[799]

The Recent Drought of 2011/12

Drought is increasingly becoming more of a problem in certain parts of England and this has been aptly shown in recent years. The weather in recent years has had a major impact on the way in which individuals can use

[797] '*Water Resources and Supply: Agenda for Action*", Published by the Department For Environment, 1996
[798] '*Water Resource Planning Guideline*' Published by the Department for Environment, 1997
[799] '*Water Resource Planning Guideline*' Published by the Department for Environment, 2011: (http://publications.environment-agency.gov.uk/PDF/GEHO0411BTWD-E-E.pdf)

water. In 2012 drought has been raised as a concern by some of the largest providers including Thames Water and South East Water[800].

England and Wales have recently suffered from below average rainfall for 18 of the past 23 Months (to February 2012). In some areas river flows have been reduced to 31% of average levels, which is below the infamously dry year of 1976. This resulting shortage is forcing many companies to prepare hosepipe bans and the providers are urging individuals to use as little water as possible. [801]

The Environment Agency has already confirmed that 2011 has been the driest year in England and Wales for 90 years. (Surprisingly England's contiguous partner Scotland experienced above average rainfall in many parts.) Environmentally this results in the water flowing towards rivers as opposed to being soaked into aquifers. Many reservoirs are below the required amount including Bewl Water the Kent reservoir which (in February 2011) was only 41 % filled to capacity. "*Drought is already an*

[800] WaterGuide.org.uk : (http://www.water-guide.org.uk/blog-water-company-drought-fears-for-2012.html)
[801] "*South East Latest Part of England Officially In Drought*." BBC News, 20 February 2012: (http://www.bbc.co.uk/news/uk-england-17102615)

issue this year with the South East, Anglia and other parts of the UK now officially in drought, and more areas are likely to be affected as we continue to experience a prolonged period of very low rainfall. It is not just the responsibility of the government, water companies and businesses to act against drought. We are asking for the help of everyone by urging them to use less water and to start now."[802]

In April 2012 the Environment Agency added an additional 17 English Counties to the drought list, which has a direct impact on 35 Million Britons.[803] England received less than 60% of its average seasonal rainfall and the Environment is suffering.[804] Due to the drought, river levels plunged which had implications on the whole environment.[805] Not only are domestic costumers suffering from hosepipe bans, but the bird and fish population is suffering as is the water available for agriculture.[806]

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[802] Environment Agency Press Release
[803] "*Britain's Water Shortages Threatens Rivers Wildlife*." Channel 4 News, 16 April 2012☹ http://www.channel4.com/news/britains-water-shortages-threaten-rivers-wildlife)
[804] "*Drought May Last Until Christmas: Environment Agency*" International Business Times, 16 April 2012: (http://www.ibtimes.co.uk/articles/328392/20120416/droughts-last-beyond-christmas-midlands-southwest-zones.htm)
[805] "*Drought May Last Until Christmas"* ITV News, 16 April 2012: http://www.itn.co.uk/home/43247/Droughts+may+last+until+Christmas)
[806] "*Drought May Last Until Christmas: Environment Agency*" BBC News, 16 April 2012: (http://www.bbc.co.uk/news/uk-england-17690389)

The Flood after the Drought

After such a dry spell during 2011/12 the British climate was to suffer from another extreme and experience unusually high amounts of rain. In 2012 the month of June was the wettest ever recorded in Britain since the British Weather records began in 1910. The average rainfall was 145.3mm which is roughly twice as much as is expected. (In addition to this deluge of rain the country was subjected to a lack of sunshine. The 2012 June was the second dullest June on Record.)[807]

Flooding

Climate change has one significantly visible impact on the water system in Britain in addition to drought which is flooding. With the variations in precipitation due to climate change floods across Great Britain are now becoming more common both from rivers and the coast.[808] Severe flooding

[807] "*Wettest June on Record Met Office Shows*." BBC News, 2 June 2012: (http://www.bbc.co.uk/news/uk-18678659)
[808] Hall et al, "*Impacts of climate change on costal flood risk in England and Wales: 2030-2100"* Philosophical Transactions of The Royal Society, Volume 364, (2006): (http://www.safecoast.com/editor/databank/File/impactCConcoastalfloodriskUK.pdf)

in 2000 resulted in a needed assessment and restructuring of the British flood risk programme and the resulting reactions to future floods.[809] Thus there is a need to prevent the negative impact of future floods which includes; increasing the storage for floodwater, improving drainage, preventing river encroachment and importantly prevent future floods.[810]

Learning from the Climatic Changes

In 1997 The Labour Government held a Water Summit to discuss the drought of the previous years. This had various results:[811] In March of 1999 a White Paper was Published entitled '*Taking Water Responsibly*'[812]

From this several important changes occurred[813]:

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[809] Dessai S, et al, "*Defining and Experiencing Dangerous Climate Change*.": Climatic Change, Volume 64, Issue 1 (2004) (http://www.uea.ac.uk/~e120782/papers/dangerous.pdf)
[810] Shih and Nicholls, "*Urban Managed Realignment: Application to the Thames Estuary, London*." Journal of Costal Research Vol 11, 2007
[811] Groundwater UK: (http://www.groundwateruk.org/Implications-of-the-Water-Act-2003.aspx)
[812] "*Taking Water Responsibly*" White Paper, House of Commons, March 1999
[813] Many of the suggestions were implemented through the legislation of The Water Resources Act 1991 and the Environment Act of 1995 – subsequently the Water Act of 2003 added to these suggestions and expanded the legislation. The aforementioned legislation shall be discussed later in the Thesis .

The Environment Agency's National Resources Strategy was proposed and later drafted to include proposals on how to deal with climatic changes of the future.

Company Drought Plans became essential, each provider having to provide the Government with their plans for future drought.

Catchment Abstraction Management Strategies became part of the management process. These ensure that each Catchment has an adequate and sustainable management system for abstraction.[814]

"*Although companies are voluntarily meeting leakage control targets and implementing other measures, this change in water management strategy is unlikely to have occurred in the absence of national guidance. It has taken national concern over global warming and over water depletion impacts on ecosystems to stimulate the type of water conservation measures that did not evolve naturally among the private water providers in the past. Most water companies, with a few exceptions, believe that they can withstand a repeat of*

[814] For more information see the Environment Agency Webpage – in addition to this catchment management Strategies shall be discussed later in the Thesis : (http://www.environment-agency.gov.uk/business/topics/water/119927.aspx)

past drought patterns given current infrastructure and water planning policy. Managers tended to credit current resilience to recent measures to reduce both leaks and consumption and to the period of storage and distribution enhancement completed in the 1970s and 1980s. Construction projects that took place during the past two decades were attributed specifically to the response to the 1975/6 drought and towards expectations of growing population and consumption. Indeed, most water service companies were able to provide sufficient water during the 1995 drought in contrast to 1976 when most regions restricted use and many resorted to emergency measures."[815]

The scrutiny towards the supply of water from a governmental standpoint has if anything increased since privatisation.

"*Ironically although privatisation was intended to remove companies from regular political interference and vigorous regulation, perceived company mismanagement and regulatory failings, together with a more open and*

[815] Subak, Susan "*Climate Change Adaption in the U.K. Water Industry: managers' Perceptions of Past Variability and Future Scenarios*" Water Resource Management 14, 2000

participatory policy process, have resulted in greater public and government scrutiny."[816]

Water Resource Planning Guidelines

These guidelines are government guidelines which are published to help private operators to develop and review their personal water resource plans. Water providers have a legal duty which is enshrined in Statute to prepare and maintain their individual Water Resources Management Plan.[817] The Water Industry Act[818] sets out procedural requirements and a process which companies must follow in developing their plans. The plans among other things still demand that a baseline forecast of water demand over the next 25 years be forecast. It is essentially a document which in isolation provides a realistic and applicable plan for that company to manage their water resources efficiently enough to provide water which meets the supply demand balance required.

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[816] Bakker Karen, "*Privatising Water, Producing Scarcity: The Yorkshire Drought of 1995."*Economic Geography, Volume 76, No 1 , 2000 See also Maloney and Richardson "*Managing Policy Change in Britain: The politics of Water*." Edinburgh University Press, 1995

[817] The Water Industry Act Section 37 A to D, as amended by Section 62 of the Water Act 2003

[818] As discussed in chapter 6.

Demand

The main issue for water companies is not a continued increase in demand but an increase in the number and the size of the peaks. Thus as the demand for water is increasing, the increase is not creating the pressure which could result in scarcity. The times when demand is most concerning is during short occasions of intense demand.[819]

From the mid 80s to the mid 90s (1996), the demand from water customers across England and Wales only increased by 3%. This is not to say that there has been a decrease in either the population or in domestic consumption, as neither have happened. There has however been a reduction in industrial use which has reduced during that time from around one third to one quarter of consumption. [820]

[819] Herrington, P R "*Alalyzing and Forecasting Peak Demands on The Public Water Supply"* CIWEM, 12, 1998
[820] "*Water Resources and Supply: Agenda For Action, Department for the Environment and the Welsh Office. The Stationary Office, London. 1996*

The Environment Agency

The Environment Agency is the Government Agency which is responsible for taking action if a drought occurs. Their monitoring and actions can be perused in their extensive drought plan.[821] Water companies can for example apply[822] to the Environment Agency for Drought Permits which would allow them to extract water from sources which they have previously not been granted permission to extract. The drought plan conveys a plethora of information regarding how drought monitoring is carried out, how reporting is carried out and the management structure and management actions taken.

[821] Environment Agency Drought Plan 2012: http://publications.environment-agency.gov.uk/PDF/GEHO0112BWAY-E-E.pdf)

[822] National Permit Centres grant drought permits and are governed at a local level by Area Managers.

British Problems with Climate Change.

"*Climate change will affect the basic elements of life for people around the world – access to water, food production, health, and the environment. Hundreds of millions of people could suffer hunger, water shortages and coastal flooding as the world warms*."[823]

Britain is like every other country and will be subjected to the results of future climate change. One of the resulting factors of climate change is that the hydrological cycle will be disturbed altering the pattern of previously predictable rainfall. By the 2050s DEFRA have estimated that between 27 Million and 59 Million people in the UK may be living in areas affected by a water supply deficit. There is also predicted to be less water available for the needs of crop irrigation.[824] Therefore managing water resources efficiently, particularly in areas where there is scarcity is important now and its importance will only grow in the future.

[823] http://www.hm-treasury.gov.uk/d/Summary_of_Conclusions.pdf
[824] "*Summary of the Key Findings from the UK Climate Change Risk Assessment 2012*"Climate Change Risk Assessment (DEFRA) 2012: (http://randd.DEFRA.gov.uk/Document.aspx?Document=Summary_of_Key_Findings.pdf)

The Climate Change Act 2008[825] was established to initiate plans for long term reduction in green house gas emissions.Section 56 of the Act[826] enacted that a Report on the Impact of Climate Change must be drafted and presented to Parliaments detailing the possible climate changes that Britain could expect and therefore prepare for in the future.

Predicting the weather is by nature not exact. The official government study however has predicted a distinct increase in mean temperature over the entire isle of Britain. This range varies widely across the country up to an increase of just under five degrees Celsius. One to three degrees in Winter and one to just under five degrees in summer

Precipitation is also predicted to change with a decrease during Summer of 20-40% to a possible increase of 1 – 7%. During the winter months there is a predicted increase of between 5% to 30%. Interestingly the counties in the South of England are due to see the largest predicted increase.[827]

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[825] The Climate Change Act 2008: (http://www.legislation.gov.uk/ukpga/2008/27/contents)
[826] The Climate Change Act 2008 , Section 56
[827] "*The UK Climate Change Risk Assessment 2012 Evidence Report – Statistics Listed in Annex A and Annex B – Presented to parliament pursuant to Section 56 of the Climate Change Act 2008 – Year 2012: http://randd.DEFRA.gov.uk/Document.aspx?Document=Evidence_Report_Annex_A_and_B.pdf)*

Several things should be noted from these figures: Firstly there is a large discrepancy between the predictions such as the possible reduction of up to 40% in Summer to a possible increase of up to 7%. Secondly if the rainfall is concentrated then this would be less helpful to dry depleted land than rainfall which is less but constant and thirdly even though certain areas in the South are predicted to have a possible increase in precipitation areas in Britain such as Scotland are still shown to have an overall greater precipitation level.

The Climate Change Risk Assessment (CCRA) 2012 was and is the first report of its kind and is planned to be followed in five years by an updated report. The report was commissioned to investigate and publish the effects that climate change would have and was compiled independently through Government direction and funding. Evidence for the assessment was gathered in eleven sectors including water.[828] The main report had many findings which related to the various sectors, however water was prominently highlighted in the report as a main concern.

[828] The others being : Agriculture; Biodiversity & Ecosystem Services; Built Environment; Business, Industry & Services; Energy; Forestry; Floods & Coastal Erosion; Health; Marine & Fisheries; Transport

" *Higher summer soil moisture deficits, increasing demand for irrigation to maintain crop yields and quality… Drier Conditions and any increase in the frequency of drought will reduce agriculture and timber yield and affect woodland condition … Increased competition for water resources in the summer owing to reduced summer rainfall and the need to address unsustainable abstraction."*[829]

Interestingly although it has been England and Wales that have suffered the most from droughts and the effects of change in the climate, the Chief Executive of Scottish Water saw this as one of the two major threats to the provision of water in Scotland.[830]

Water Sector Report[831]

The Water Sector Report was one of eleven sector reports published by the Climate Change Risk Assessment Committee for research towards the

[829] "UK Climate Change Risk Assessment: Government Report. Evidence Report (Setting out the evidence that was laid before parliament on January 2012) Published by HM Government: (http://www.DEFRA.gov.uk/publications/files/pb13698-climate-risk-assessment.pdf)
[830] Interview with R Ackroyd, Chief Executive of Scottish Water, See Appendix (1)
[831] "*Climate Change Risk Assessment for the Water Sector*" January 2012, DEFRA (http://www.legislation.gov.uk/ukpga/2008/27/contents)

overall climate change report. It is an extensive report, which used a variety of sources and opinions. The main conclusions are as follows:

Summer river flows may decline in the next 30 to 50 decades, but these changes will be regional and not nationwide.

Pressures however will increase across Great Britain from the South of England to Scotland

The majority of the island will be subject to rising costs in water provision. An important step for households and the United Kingdom to reduce water pressure is to reduce domestic need and therefore provision.

Abstraction may become a serious problem as many rivers are predicted to fail possible flow targets. "*Abstraction may become unsustainable in a large proportion of rivers due to low summer flows. There is an urgent need to consider how to continue to maintain public water supply without causing environmental damage as demands for water potentially increase in a changing climate. In the near term (2020s) a significant proportion of rivers could fail existing environmental flow targets if we continue to use historic*

climate to guide our regulatory framework…Changes in the way we manage water resources may also be needed to maintain supplies and enhance the environment however, and abstractors may need to consider new ways of securing water supplies, for example through options for sharing resources (both within and across sectors), forming abstractor groups or developing sites in areas with water available." [832]

Resource sharing in England and Wales is now being advocated by a variety of water authorities and was proposed by James Bream of Business Stream as being one way to ease water pressure within water districts.[833]

Key Findings of the Report:

Precipitation is difficult to predict and particularly difficult to predict exactly. It is commonly believed that river flow will increase in winter and decrease during summer. The worst case scenario would see summer river flows reduce by up to 35% in the driest parts of England.

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[832] "*Climate Change Risk Assessment for the Water Sector*" January 2012, DEFRA (http://www.legislation.gov.uk/ukpga/2008/27/contents)
[833] Interview with, James Bream, Business Stream, see Appendix (1)

Efficient use of possible surplus during winter may offset a reduction in precipitation during summer. It is however likely that in the 2020s a majority of people in Great Britain will be living in areas where there is considerable water pressure. By the 2050s unless supply and demand measures are enacted then there may be great challenges in the provision of water.

Abstraction in the summer months may become impossible due to the depleting water in the waterways. This however cannot be confirmed as the environmental and ecological system cannot be exactly predicted. In addition to the decrease in precipitation due to the drier weather agriculture would have an increased demand on the need for irrigation which would put an additional strain on the water availability.

In addition to climate change there are an number of factors which will affect the availability and the quality of water including: change in population needs, change in population demands (in how water is used), the distribution of wealth, global issues, governmental decisions and pollution.

In summary the report highlights the fact that there is an immediate need to consider how demand and supply may be balanced in the future with the

potential that in the near future due to climate change the scarcity of water may increase, in conjunction with the demand and produce problems with provision.

The British Government and Climate Change.

The British Government have for a considerable time been concerned about Climate Change and its implications to the ecological cycle including the hydrological cycle. The British Government authorised Nicholas Stern[834] to draft and release a report discussing the effects on global warming on the world economy.[835] The Review stated that Climate change has the potential to be the greatest challenge the world has ever seen. Water was at the forefront of the future problems. "*Warming will have many severe impacts, often mediated through water*."[836]

The Climate Change Act 2008 was additionally recently passed to ease

[834] Nicholas Stern is Chair of the Grantham Research Institute on Climate Change and the Environment at the London School of Economics and Chair of the Centre for Climate Change Economics and Policy at Leeds University.
[835]Stern, "*The Economics of Climate Change*" HM Treasury, 2006: (http://webarchive.nationalarchives.gov.uk/+/http://www.hm-treasury.gov.uk/stern_review_report.htm)
[836] Stern, "*The Economics of Climate Change*" HM Treasury, 2006: (http://webarchive.nationalarchives.gov.uk/+/http://www.hm-treasury.gov.uk/stern_review_report.htm)

climate change with the aim of preventing further climate change by encompassing more environmentally friendly practices, such as the reduction of carbon emissions. Although the Act does not discuss in detail the implications on the provision of water, it was certainly drafted holistically to incorporate all aspects of the environment.[837]

In addition to The Government it is important that the agencies with power over the water industry are aware of the threat of climate change.

"*Climate change presents both opportunities and threats to water resources. It is predicted that rainfall patterns will change; recent climate predictions suggest wetter winters with little change, or drier conditions, expected in the summer. This will have an impact on water resources. For example, the amount of water that can be taken from rivers may be constrained by lower water flows. Changes to the seasonal distribution and intensity of rainfall will affect the recharge of reservoirs and ground water; this may be beneficial or not. In addition, warmer temperatures brought about by climate change could increase the demand for water. For instance, the watering of gardens will be expected to rise in a hotter climate, while wetter*

[837] The Climate Change Act 2008: (http://www.legislation.gov.uk/ukpga/2008/27/pdfs/ukpga_20080027_en.pdf)

winters may put additional pressures on drainage."[838]

Combating Drought

On average, each individual uses around 160 litres of water a day (1/3 for toilet flushing – 1/3 for bathing). The recent White Paper 'Water for Life', revealed that the Government is now committed to reducing that figure to 130 litres. This however will not be enough to avert the crisis brought about by the double impact of global warming and the projected rise in population[839]

In the sphere of management two examples in which the British Government are advocating the restricted use of water is through metering and in times of drought a possible hosepipe ban:

[838] "*Preparing for the future – Ofwat's Climate Change Policy Statement*", OFWAT, 2008/9: http://www.Ofwat.gov.uk/sustainability/climatechange/pap_pos_climatechange.pdf)
[839] '*Beauty of the Lake District under Threat as British Rivers Run Dry*." The Observer, 22 January, 2012

Metering

"*When [a meter] is fitted water usage drops by an average of 12.5% in a household.'*[840] *Around 37% of households are now fitted with water meters and the figure is expected to rise to about 50% by 2015, cutting even further the average amount used by each person to reduce the strain on our rivers and reservoirs."*[841]

Hosepipe Bans

Outdoor water use restrictions are commonly called hosepipe bans. This term is self explanatory in that those provided with water are forbidden to use water for outdoor activities, for example watering plants or washing cars. The Water Industry Act 1991[842] states that when a ban is imposed any individual breaching the terms of the ban is guilty of a criminal offence and is subject of a fine which may exceed no more than £1,000.

Hosepipe bans are becoming more common in England, due to the decrease in rainfall and an increase in population. As early as April in 2012 seven

[840] Quotation from Trevor Bishop the Head of the Environment Agency
[841] '*Beauty of the Lake District under Threat as British Rivers Run Dry*." The Observer, 22 January, 2012
[842] The Water Industry Act 1991, Section 76: (http://www.legislation.gov.uk/ukpga/1991/56/contents)

providers in England imposed hosepipe bans which affected 20 million individuals. The Ban is a cost effective way of saving water. The other prime way in which water can be saved is be a reduction in leakages, but infrastructural work is very costly and takes considerable time to implement. "*With this ban we would expect to see up to 150 Million litres of water a day saved. To get the same saving from replacing leaky pipes would cost £1.2 Billion and take 10 years, so we have to be practical about this*." Richard Aylard, Thames Water Sustainability Director.[843]

British Attitudes

British attitudes towards hotter dryer summers is interesting but not surprising. A large proportion of individuals in Great Britain agree that there have been hotter and dryer summers, but most are unable to determine the years in which they occurred. When these summers happen a large majority of people admit to using more water, but agree that hotter dryer summers produce water shortages and that in the future if such summers were to occur

[843] "*Hosepipe Ban for Drought Hit Areas*" BBC News, 5 April 2012 : (http://www.bbc.co.uk/news/uk-17615364)

they would try to use less water.[844] These responses can only be called human. It demonstrates an ability to remember the event but not the specifics and the optimism that if those events reoccurred that the individuals who admitted to having used more water would reverse that habit and use less.

It is the case that although certain members of the public appreciate the problems with water provision and its scarcity, others are oblivious of the needed fragility of its use. The article in the Telegraph during the hosepipe ban of 2012 '*I'd pay extra to fill my little girl's paddling pool*'[845] demonstrates that the concept of the hosepipe ban is not only resented by some but not fully comprehended. The author asks " *Why can't those of us who want to fill up our children's paddling pools, or turn on the sprinklers to keep our lawns alive, be allowed to pay more to do so?*" The point of rationing a finite resource is to enable allocation on need and not on ability to pay.

[844] 60% of those surveyed in England said they would use less water in hotter dryer summers, this is less in Scotland with only 44% saying they would use less water. Survey taken from Article: Palutikof et al, "*Public Perceptions of Unusually warm weather in the UK: impacts, responses and adaptations*" Climate Research Vol 26, 2004

[845] Leunig Tim "*I'd pay extra to fill my little girl's paddling pool*" The Telegraph, 16 April, 2012: (http://www.telegraph.co.uk/earth/drought/9206130/Drought-Id-pay-extra-to-fill-my-little-girls-paddling-pool.html)

The Pending Future Problems

Britain has to resolve national problems and deal with global phenomenon such as climate change. It does have a management system and varies strategies to aid sustainable extraction. Future Water[846] for example is The Department for the Environment's policy document on sustainable water extraction makes it clear that climate change is a major issue which needs to be considered and as much as possible (at a national level) prevented. The British system of provision will be analysed later in the Thesis , but regardless of the result it is irrefutable that the water problem has been recognised as a severe threat to the future of the country.

"*Water resources are affected by land use change and a range of social and economic drivers as well as climate. These include changes in population needs and/or demands, the distribution of wealth, global stability, as well as government decision making. Changes in water availability affect biodiversity, agriculture, industry and public water supplies. Water resources cannot be considered in isolation and adaptation measures need to reflect the complex linkages between sectors. In the longer term, the way*

[846]Future Water:
http://archive.DEFRA.gov.uk/environment/quality/water/strategy/pdf/future-water.pdf

we manage our water resources is likely to require a number of changes, including greater water efficiency in all sectors and new approaches for enhancing the environment with changing climate conditions."[847]

The system in England and Wales because it is governed not centrally but locally and privately is reliant on those private contractors firstly being aware of the various pressures on the water industry and then adapt to the changes necessary.

Great Britain faces a variety of challenges with a variety of causes: Population Growth, Increased and change of usage, Leakages, Adequate Water Management, Pollution and Climate Change.

These factors can be injected into the demand and supply equation with the desire that demand and supply will continue to balance. This is however easier to summarise than to resolve, especially as these problems are becoming exacerbated with time.

[847] "Climate Change Risk Assessment for the Water Sector" January 2012, DEFRA (http://www.legislation.gov.uk/ukpga/2008/27/contents)

Part 2

Global Future Concerns

In addition to the global problems discussed in the Appendix of the Thesis [848] there are several new global concerns that may potentially cause issues to the provision of clean water in the future. What is now clear is that water management and water provision has to be sustainable and efficient.

Future Sustainability

The definitions of sustainable water development has been polarised and is often tailored to the way in which the subject deems. A leading water academic Professor Daniel Peter Loucks proposed the following definition:

"*Sustainable water resource systems are those designed and managed to fully contribute to the objectives of society, now and in the future, while*

[848] Chapter 1 and Appendix 5 discusses the factors influencing water scarcity which include but are not restricted to; Population Growth, Wetland Erosion, Pollution, Desertification, Climate Change and The Increasing Water Footprint.

maintaining their ecological, environmental and hydrological integrity."[849] A simple but intelligent definition which was challenging to create, difficult to fully comprehend and most importantly is difficult to establish at a National and at an International level.

Business is a powerful agent of change. This change in any industry including the provision of water may incorporate both sustainable development and profit. Properly directed the primary motive of private enterprise (profit) may advance and not prohibit the transformation towards ecological sustainability. "*Some might say linking "global business" and "sustainable development" is an oxymoron, but they would be sorely mistaken … Business more than either government or civil society is uniquely equipped at this point in history to lead us toward a sustainable world in the years ahead."*[850]

If there is to be sustainable development in England and Wales (and indeed globally) the private corporations obviously have a major role to play.

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[849] Loucks, Peter and Gladwell, Peter "*Sustainability Criteria for Water Resource Systems*" Cambridge University Press, (UNESCO), 1999.
[850] Hart, Stuart, "*Capitalism at the Crossroads*" Second Edition, Wharton School Publishing, 2007

Loucks recognises that businesses are not only the primary polluters, but may also be the prime developers of sustainable development.

"*Business leaders can be a force for sustainable development of water and other natural or environmental resources if they are allowed to act as private organisations. That means not being expected to perform public sector chores (such as creating jobs just to reduce unemployment or the number on welfare) and being encouraged through various economic incentives to internalize environmental costs and to produce more with fewer resources, and with less pollution.*" [851]

Sustainability is no longer considered a word which hinders commercial development, indeed many corporations recognise that a profitable future must incorporate sustainable development. Many companies are independently becoming more conscious of their use of water for many reasons including but not isolated to pecuniary reasons. The other factors include media, employee and customer encouragement.

[851] Loucks, Peter and Gladwell, Peter "*Sustainability Criteria for Water Resource Systems*" Cambridge University Press, (UNESCO), 1999.

The burden of sustainable water management should not only be carried by corporations that use water and corporations that provide water, but on the government. If this development is to benefit all stakeholders, which it would, all stakeholders should contribute to the effort. Businesses, providers and the Government should all interact towards a common goal, and indeed the domestic user also has a individually small but collectively large role to play in the process.

Sustainability is slowly being recognised at a national level and at an international level by institutions such as the European Union and the World Bank. With pollution being such a great global problem there must be a global solution, which would involve the reduction of pollution across the globe in large land masses, such as China. Sustainability is not a new concept, but it is gaining new appreciation and that appreciation must transform into international global action at both a national and international level if there are to be positive influences on the ecological and hydrological cycle.

There are many elements to sustainability, which must be integrated to produce an economically valid and environmentally proactive approach to

provision. The collaboration of stakeholders, ensuring that there are adequate resources and maintaining educated managers and staff are all key to the development process.[852] To ensure a sustainable provision of global freshwater is not an easy task but it is an essential task.

Water Inefficiency

One area where there is major concern and in which there could be governmental improvement, is the promotion and education of water reduction, at both a business and a domestic level. The introduction of metering is one way to focus the end user on the amount used as the supply obviously directly has an impact on the price. Metering is not universal and even where meters have been installed this does not erase the need to educate the user on how to save water. For the domestic user simple information could save them considerable amounts of money. An example would be to fix a leaking tap. Businesses should also be informed that saving water not only benefits the Nation's sustainable use of water, but would save them money.

[852] Loucks, D P, "Sustainable Water Resource Management", Water International, Volume 25, Number 1, Pages 3 – 10, March 2000.

Texas Instruments,[853] which is the world's fourth largest producer of semiconductors succeeded in reducing their water use in production of semiconductor wafers and produced more wafers with the same production equipment. They reduced their water usage by 65 fewer gallons per minute and saved nearly $100,000 per quarter from the purchase of the water and the treatment of the waste water discharge. The cost of this process costs between $60,000 and $100,000 per year and hence the company has a profitable return within a maximum of four months.[854]

The reduction in water usage may at first seem counter intuitive for a profit orientated water provider, however such advice builds relationships with domestic and corporate users[855] and allows businesses in turn to make more profit with possible expansion and the production of more water dependent goods.

[853] http://www.ti.com
[854] Gordon, Pamela "*Lean and Green, Profit from your Workplace and the Environment*" Berrett-Koehler Publishers, 2001.
[855] as stated in the meeting with the business stream chap

Fracking

Horizontal drilling and hydraulic fracturing (commonly called fracking) has and is enabling the oil and gas industry to extract natural gas from rock formations deep within the ground called shale[856].

Fracking has recently been introduced to Britain. It is estimated by some corporations that there are trillions of cubic meters of gas which could be extracted. Initial extractions have already commenced drilling in Britain in certain locations. One of those locations outside of Blackpool in Lancashire apparently holds up to 5.6 trillion cubic meters of gas alone. The main concern in America and now indeed in Britain is the impact that the drilling has on water supplies.

"Each well can consume up to 9 million litres of water a day, of which around 50% can be reused – the rest becomes heavily polluted. The US

[856] American Petroleum Institute. " Freeing up Energy. Hydraulic fracturing: Unlocking America's Natural Gas Resources." July 19 2010.

Environmental Protection Agency (EPA) has warned that the water withdrawn from aquifers on this scale can lead to 'destabilisation of the geology'…an even greater concern of fracking opponents is what happens to the mixture of water, gas, metals and naturally occurring radioactive materials that flows up to the surface once fracking has taken place. In heavily drilled parts of the US, tap water has caught fire …"[857]

Although the current British Government have stopped fracking due to tremors that were more than likely triggered by drilling there is nothing to prevent future Fracking. Concerning the water supplies and the potential pollution The British Geological Society agrees it is 'very unlikely' that the fracking would contaminate water supplies, such beliefs are not however globally held and countries in Europe (including France) and certain states in America have banned fracking until further research has been completed.

In America 3 million gallons of water is needed on average for a single shale gas well. Most of this water comes from surface water bodies such as rivers and lakes but the water can also come from ground water, private water and reused water. Although it is argued that this water is only a small percentage

[857] '*The Shale Gas Revolution'*, The Week, December 2011

of the total water resource per water basin (0.1 – 0.8%) its rapid extraction has led not only to it becoming the fastest growing development resource but one which is surrounded by controversy.[858]

The New York State Department of Environmental Conservation's (NYDEC) Revised Draft Supplemental General Environmental Impact Statement (SGEIS) recommends that shale gas development be banned from watersheds that provide high-quality drinking water to New York City.[859]

Water contamination due to fracking, is still a large concern and many believe that there is a great potential for water contamination.[860]

Fracking is a possible threat to the provision of clean water but it is not in isolation. Fracking is new technology's current symbol of the possible threats posed to water provision. In the future fracking and other

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[858] "*Modern Shale Gas Development in the United States: A Primer*" US Department of Energy, Office of Fossil Energy National Energy Technology Laboratory, April 2009
[859] New York State, Department of Environmental Conservation. "*Revised Draft Supplemental General Draft Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program: Well Permit Issuance for Horizontal Drilling and High-Volume Hydraulic Fracturing to Develop the Marcellus Shale and Other Low Permeability Gas Reservoirs*." September 7, 2011
[860] "*New York City is Note Protected! Why New York needs a Statewide ban on Fracking*" Food and Water Watch, Fact Sheet November 2011 : http://catskillcitizens.org/learnmore/Final_NYCNotProtected_WEB.pdf

technological advancements may pose threats to water. New Business and New Technology must be embraced provided that it is safe and does not negatively effect the water supply, which is infinitely more important. If technology is to be accepted it must be sustainable as a business and sustainable for the environment.

Water Theft

With a commodity as scarce and valuable as water it is only a matter of time before theft (as opposed to disputed use or boundary conflict) becomes an international issue. Technology now allows for artificial storms to be created through the use of giant ionisers. These ionisers pump negatively charged particles into the air, which is then collected by dust and carried into the air, water then condenses round the dust to form rain clouds.[861] This gives one country the possibility of collecting clouds, which it would not have had and indeed water which it would not have had. The pertinent and unresolved question being if they did not have the water, then who did and at what point would legal possession pass. The theoretical debate over this concept would thus far be speculative, but time shall no doubt produce a

[861] "Looks Like Rain: Science creates desert downpours" The Sunday Times 2 January 2011

case where these questions are posed. Water sharing on land however is not theoretical.

There is no international treaty governing the international sharing of water. There is a United Nations Convention on the law of the Non-Navigational Uses of International Watercourses[862] This has however only been ratified by twenty four countries, excluding Great Britain, which is eleven short of the threshold which would bring it into force. With almost fifty percent of the world's population relying on water flowing downstream from a contiguous country, this leaves the world in a precarious position of international water dependency. There are several countries downstream of China's various waterways including: Bhutan, Bangladesh, India, Burma, Thailand, Cambodia and Laos. China is currently planning and developing in addition to a massive South to North West Canal encompassing three major waterways, to develop seven more dams, which will greatly restrict the water availability of downstream riparians. The dam on the Brahmaputra is planned with the construction of two hydroelectric power plants, which would produce twice as much power as the plant on the Three Gorges Dam.

[862] United Nations Convention on the Law of the Non-navigational Uses of International Watercourses (http://untreaty.un.org/ilc/texts/instruments/english/conventions/8_3_1997.pdf)

Even before the water reaches the plant forty percent of the flow would be diverted to irrigate Chinese agriculture. This is a huge concern for downstream countries such as India and Bangladesh. Bangladesh alone has 20 million farmers who depend on the river for irrigation.[863]

There are at least four principals of riparian territoriality:

Absolute Territorial Sovereignty where complete power lies in upper riparians.

Absolute Territorial integrity where state has the right to demand the continuation of the natural flow, but a state may not restrict that natural flow.

Community of Property in Water suggests that water rights are either vested in the collective body of riparians or are divided proportionally.

[863] "Whose Water Is It" Pearce F, " New Scientist Special Report, 28 April 2012

Restricted Territorial Sovereignty prohibits detrimental increases in usage and prohibits detrimental alterations to the nature of the body's flow.[864]

The problem with the concept of 'water theft' is that downstream riparians consider over consumption to be theft where as the up stream riparians consider it to be their legal and natural right.The Nile's discharge is one example of a water resource which is being exploited to an unsustainable and detrimental level by upstream riparians. If there is to be efficient and effective change there must be a holistic strategy which incorporates the views of all the riparians.

By the time the Nile reaches the sea, more than 90 percent of its massive 50 to 80 km of water flow each year is withdrawn from the river for a variety of needs both community based, agricultural and industrial.[865]

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[864] *Silverband , I J "Israeli-Palestinian Water Literature's Misplaced Dependence Upon Customary International Law" Envtl. L . 603, 2007.* – The principles of sovereign possession taken from information from Berber FJ.

[865] Schneider, R "Rationale and Framework for Integrated, Watershed based Management of the Nile River Basin", Frontiers of Earth Science in China, Vol 4, No 1, March 2010.

In the future if the Nile (and other waterways) is to be used as a sustained resource then these riparians will need to do more to work with each other for mutual benefit towards each riparian state and importantly the Nile itself.

Water Terrorism

The threat of Terrorism is also a concern which has been recognised since September 11, 2001. The destruction of a water provision facility is now considered a major threat by many countries including that of America.[866] In February of 2012 The United States published a document outlining their grave concerns over future global instability brought on by water scarcity resulting in certain countries experiencing State failure. "*Water shortages, poor water quality and floods by themselves are unlikely to result in state failure. However, water problems when combined with poverty, social tensions, environmental degradation, ineffectual leadership, and weak political institutions contribute to social disruptions that can result in state failure… The lack of adequate water will be a destabilizing factor in some countries because they do not have the financial resources or technical*

[866] Terrorism and Security Issues Facing the Water Infrastructure Sector, CRS Report for Congress, May 2006 : (http://fpc.state.gov/documents/organization/68790.pdf)

ability to solve their internal water problems. In addition, some states are further stressed by a heavy dependency on river water controlled by upstream nations with unresolved water sharing issues. In addition to the problems aforementioned the Report highlighted that in the future there is great risk of water being used in an aggressive way. Water could be used as a 'weapon' with an upstream country cutting supply. [867]

Here the threat of trouble from water is shown to emanate from multiple locations. Not only is there the potential threat of a water supply being poisoned or restricted either by an act of terrorism or by an upper riparian restricting supply, but the lack of water may be the cause of 'state failure'. Thus in the future and with respect to water provision on a global scale it is not only important that countries monitor their supply to possible terrorist attempts, but ensure that provision (or lack of) does not destabilise countries, which in turn could lead to civil unrest.

[867] "Global Water Security" Intelligence Community Assessment (USA) , February, 2012 http://www.dni.gov/nic/ICA_Global%20Water%20Security.pdf

Escalation of Conflicts

In addition to a possible war over water or the creation of water terrorism water is one important element, which may lead to an escalation in an existing conflict or increase existing violence.

Water is just one element, which has intensified the conflict between Israel and Palestine. The West Bank Aquifer, which has a sustainable natural yield of approximately 300 million cubic meters (MCM) of water annually, is being overdrawn by approximately twenty five percent annually. From this Israel is afforded only 350 cubic meters of water per year per capita and the Palestinian territories are afforded less than 250 cubic meters of water per year per capita.[868] Water may not be the reason for a future intensification in conflict nor may it be used as a weapon of conflict but it may be the last regional stress, which is the catalyst of conflict.

A possible solution to supply may be in an inter-basin water transfer. Turkey, a relatively water wealthy nation, has been willing to develop an

[868] Silverband Ian J, *"The History and Potential Future of the Israeli-Palestinian Water Conflict*", Silverban Ian J, Stan. J. Int'l L. 221, 2008.

inter basin water transfer system to benefit both the Israelis and Palestinians although conflict has thus far not allowed such a system to develop.

Another area is the Saharan Aquifers, which are shared by multiple arid countries, many of whom have been taking the majority of their freshwater resource from a drilled finite supply.[869]

How will the Water Industry Change in the Future?

Water is not only a necessary commodity, but a valuable commodity. As pressure increases driven by an increasing demand on the diminishing resource the drive to improve the way in which water can be used and reused has increased. Even the most extreme solutions once considered fantasy are being explored to solve the problem, including extracting freshwater from Icebergs.[870] Desalination is just one area in the water industry, which is being developed as a source to increase the amount of potable water.

[869] Loucks, DP, "*Non Renewable Groundwater Resources*", UNESCO, 2006.
[870] See Interview with Georges Mougin, Founder of Water and Power from icebergs, See Appendix 1

Desalination

"*Making fresh water from the sea was once the preserve of cruise ships and oil rich Gulf States that could afford the huge cost of energy required to remove the salt. But as rivers lakes and aquifers dry up, rains become less reliable and the cost of desalination falls, communities in all parts of the word have begun to build and plan plants to turn oceans, estuaries, salty ground water and even sewage into clean water for factories, farms and homes."*[871]

Desalination is growing rapidly as an industry primarily due to the falling cost of producing desalinated water. It is one area which both technologically and financially experts expect to change considerably in the future.[872] Presently it accounts for 9.5 million cubic meters per day and that figure is growing exponentially. Those desalinating and reusing water include some of the poorest countries including Algeria, India and Ghana, however with the change in technology and falling prices of production this could be a potential source for water in Great Britain and across the globe.

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[871] Jowit, Juliette, '*Global water crisis prompts surge in desalination plants'* The Guardian, March 31, 2010.
[872] See Interview with Dr Helge Daebel of Emerald Investments, See Appendix 1

Israel can now produce desalinated water at a cost of 55 cents per cubic meter, which is a dramatic decrease in price considering a decade ago it was over $2, per cubic meter. The price reduction in part has been attributed to the reduction in power needed to produce 1 cubic meter of desalinated water from 4Kwh to 3.5Kwh.[873]

To compare this the average cost of drinking water in Great Britain can be over £2.00 ($3.00) per cubic meter – but that also includes piping through the tap and other additional provision costs. London alone is expected to swell in population by 800,000 by 2016. To cope with this corresponding demand in water, Thames Water (one of the largest UK providers) has already built Britain's only desalination plant next to its Becton sewage works. [874]

Extraction is another method of obtaining previously unobtainable water resources. Currently non-renewable water resources of the desert are being exploited (or mined) for the benefit of the people currently living in Libya.

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[873] Bekker V, "*Israelis soak up high cost of desalination*" Financial Times, November 28 2011:
(http://www.ft.com/cms/s/0/9aacb8d8-0dd7-11e1-91e5-00144feabdc0.html#axzz27fUsaWMJ)
[874] Thames Water Webpage:
(https://www.thameswater.co.uk/media/press-releases/15972.htm)

This project is called the Great Man Made River Project and is by all accounts the largest of its kind in the world.

This project involves drilling down into the Sahara Desert, pumping water and then transporting it hundreds of kilometres to the principal cities of Libya.

The Great Man Made River Project is an unconventional method to secure Libya's present and future water supplies and the sustainability of using this water has been questioned. [875]

"*The Saharan Aquifer System is exploited by almost 8,800 water points, drillings and sources – 6,500 in Algeria, 1,200 in Tunisia and 1,100 in Libya. If this rate of extraction, shared among three countries were to be prolonged, undoubtedly, there will be serious reasons for concern about the future of the Saharan regions. Non-renewable groundwater resources supplied about 66% of the total irrigation needs in 2000.*"[876]

[875] Loucks, DP, "*Libya's Choices: Desalination or the Great Man-Made River Project*", Phys,Chem,Earth (B), Vol.24. No 4 pp 385 – 389, 1999.
[876] Loucks, DP, "*Non Renewable Groundwater Resources*", UNESCO, 2006.

This method of extraction is cautiously explained in the theory called 'Peak Water'.

Peak Water

Dr Peter Gleick, a renowned water specialist and founder of the Pacific Institute has recently published in his Biennial Report on Freshwater Resources the concept of Peak Water. Peak Water relates to the concept of Peak Oil, where after the peak of production has been passed it becomes more difficult and expensive to extract oil or indeed in this case water. Gleick states that there are two types of water renewable and non-renewable and that we are using both the renewable and non renewable sources. His arguments relating to the non renewable water may initially seem scientifically controversial, as the common and historical belief is that water is a constantly changing and renewable resource. It is the case however that Gleick's defines non renewable water (for instance the Great Man Made River) as that which is extracted faster than the natural recharge.[877]

[877] Gleick also argues that in addition to peak water there is also 'Ecological Peak Water'. Essentially describes the optimum extraction level at which human society and the ecosystem benefit from the extraction of water. Gleick argues that we when this peak is passed the ecological disruptions will supersede any benefits of water provision.

" *…The fact that the volume of extractable oil is limited, while water is essentially unlimited, means that if global water use followed a bell shape curve we would never reach a 'peak' in global water production…[However]…When the use of water from a groundwater aquifer far exceeds the natural recharge rate, this stock of groundwater will be depleted quickly. In these particular situations, the groundwater aquifer is analogous to an oil field or oil producing region. Continued production of water, beyond natural recharge rates, becomes increasingly difficult and expensive as groundwater levels drop, leading to a peak production, followed by diminishing withdrawals and reuse.*"

Gleick's primary point that water as a resource has passed its peak is worthy of note and it highlights the need for efficiency, which is one of the primary arguments proponents of the private sector use in defending privatisation. The efficient and controlled use of an aquifer limits the wasted water and decreases unnecessary groundwater depletion.

This method of extracting and transporting however has shown the feasibility of a large scale water transfer using an extensive pipeline system,

built under extreme conditions. A system, which may in the future hold the key to certain areas of water shortages.

In addition to desalinated water being consumed it can also be used for agriculture and industry. Desalination may not be the panacea to the world's water shortage, however it does provide a part of the solution.

Hydropower

"*There are two main things (That other energy providers can't provide); cost and storage. In terms of comparing renewable, it is by far the most cost efficient, on a global scale it is by far the most renewable energy, its cost is much cheaper. Storage is the other big advantage. Hydro plants have detachable towers, as opposed to wind or sunshine. In the electricity system as a whole demand and supply can balance through these towers.*"[878]

Globally hydropower provides 16% of electricity, slightly more than nuclear power. Engineers and entrepreneurs advocate that a great deal of efficient, economical energy can be extracted from other water resources, including

[878] Fink, Michael Business Director of the International Hydropower Association. Interview carried out by author see Appendix 1.

ocean waves, free flowing rivers, irrigation ditches and even the effluent discharged from wastewater treatment facilities. Daily water flow is far more predictable than other natural resources such as wind or sunshine. In addition once the power is generated it is easy to store and even a large hydro plant can generate full capacity within seconds[879]

The International Hydropower Association estimates that North America has developed nearly 70% of its available hydropower resources and Europe around 75%. In England and Wales (and the rest of the UK) hydropower has developed most of the resources available. The industry in the future will focus on the way in which these resources can be made more efficient and produce more power.

Hydropower is another area in which there will be massive changes, which shall have an impact on the water industry.

"*The technology is probably around marine energy, especially with marine currents. These are in early stage of development so far but tidal is also very important.*

[879] "Hydropower Investment" Wall Street Journal (USA Edition) , September, 13, 2010

In some places like central Europe it will be around optimising technology and making it more sustainable in Africa it will be attracting finance and building the capacity for a regulatory framework. In Asia the capital is available here development should be focused on finding a regulatory process where there is a plan and then give licenses to develop then the private sector, this is much better.

In Brazil it is a governmental planning process, the government determines why and where, then it gets put up for auction it is good from a system planning perspective. But even in this system there is a problem, the private system argue that they would plan where and why better, so there is an intellectual and practical challenge. Historically hydropower was developed by the public sector. It is very capital intensive. Once the initial large costs have been made it is economically viable as the costs are low to operate. It can be very profitable."[880]

If the International Hydropower Association is right then there will not only be future changes in technology but possibly in a move towards more private

[880] Fink, Michael Business Director of the International Hydropower Association. Interview carried out by author see Appendix 1.

control. What is certain that Hydropower, is a practical and comparably reliable way to generate power and thus will remain as a generator in the near future.

The Concept of Waste

As more sectors devise methods to extract value from by-products the concept of waste shall soon be obsolete. [881] "*Future investment will be in water and wastewater. Indeed water is so valuable that the term 'waste water' will become obsolete*."[882] In other sectors, what has previously been considered as a useless by product is finding a use and a value from water to heat.[883]

As the need to provide more water to more people escalates the need for technology, which can provide such a task will be pushed by demand.

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[881] "The Concept of Waste", The Sunday Times, 19 September 2010

[882] Interview with Disque Deane Junior, Water Asset Management, See Appendix 1

[883] Freepower Plc has developed a turbine that runs off the waste heat from industrial sources such as factory chimneys or even ovens in a restaurant. "*We use what people waste we see enormous potential in the wasted heat going up into the atmosphere from the exhausts of engines in industrial processes*." Mym Simcock, Co founder of Freepower. Quotation extracted from; The Sunday Times 19 September 2010, ' Don't let that energy just go up in smoke' by Sarah Butler. For information on Freepower see; http://www.freepower.co.uk/index.htm. For information on their financial backers called New Energy Fund lp (22% owners) see http://www.newenergyfundlp.com/home.php

Modern technology such as membrane filtration[884] are increasingly in demand as are traditional applications such as pumps, with the water pump market expecting to increase the pump market from under $30 billion in 2006 to $49 billion[885] Water reuse and recycling has also been increasing at a rapid rate and forecasts predict that this will continue. The European and Middle East market alone is expected to earn $531 million from 2012 to 2014.[886]

The interesting concept of 'Waste Water' is that most of it does not need to be treated, as it is not polluted or sullied, it is simply lost. Runoff from a home or a factory is a prime example of this. As water becomes more scarce the need to collect and use the water available will necessitate that waste water be considered in various forms; water that falls but is not used, water which is used and can be reused and water which can be used in a more efficient way. From a local to a national scale the globe will see more technologies which are not only efficient in using water but also in collecting water.

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[884] For more information including the reducing cost of membrane filtration see: Vedavyasan, C "Combating Water Shortages with innovative uses of membranes" Desalination 132 (345-347) 2000

[885] World Pumps "*Clean Water Shortages Help Grow World Pump Market*" World Pumps, September 2006

[886] "*Water Shortage Drives Recycling and Reuse markets around the World*" Membrane Technology, June, 2006

The Water Business

Water is becoming increasingly important for every sector of society including business. The water industry is worth $480 billion and is growing at a rate of 6% per year. Individuals, corporations and multinationals are now investing in a variety of different ways. Individuals can invest in the private water sector through the purchasing of shares in private companies. Now Exchange Traded Funds[887] specialising in water investment are becoming popular with investors[888], such as Claymore (Guggenheim).[889]The phrase the 'Business of Water' was used by David Festa[890] of the Environmental Defence Fund[891] in an interview conducted by the Financial Times. Festa considers the 'Business of Water' to hold 'massive opportunities', he states that executives will need a more sophisticated understanding of the business environment for water be that in the form of reducing commercial consumption or participating in the new water trading

[887] Exchange Traded Funds are a way in which one investor can invest in a variety of items, for example stocks and shares, with one purchase.
[888] One financial publication to advocate investment in the water market is "Money Week", On 20 April 2012 it focused its main article on water investment.
[889]More details of the fund can be seen at:
(http://www.guggenheimfunds.com/libraries/literature_en/cgw_fact_card.pdf)
[890] Holding the position of, Head of Land Water and Wildlife
[891] (http://www.edf.org/home.cfm)

infrastructure of selling water where it is plentiful to places where is scarce.[892]

Both the Public sector and the private sector in the future will produce new ways which will increase our global water efficiency, collection and reuse.

New Methods and New Management

There will in each sector be advancements in new technology from desalination to hydropower and many other areas. What should and will also change are the methods and techniques employed in agriculture and industry to become more water efficient.

Every country can improve their water efficiency ranging from the poorest to the richest, from the installation of electric water meters to the reduction of water used to grow rice.

[892] 'A Growing Thirst for water Management' 7 February, 2011, Financial Times (http://www.ft.com/cms/s/2/50a831ce-307c-11e0-9de3-00144feabdc0.html#axzz1DqktwRAl)

The method called the System of Rice Intensification, or SRI, emphasises the quality of the individual plants over the quantity. It applies the less is more ethic to cultivation. Uphoff has proved that if farmers plant early, give seedlings more room to grow and stop flooding fields that harvests typically double. Thus cutting water and seed costs and promoting root and leaf growth – not to mention the environmental and water benefits. Over one million rice farmers have adopted the system and this is predicted to swell to 10 million.[893]

One of the most interesting concepts is that both scientists and farmers have missed this simple technique (or forgotten) for thousands of years, only for it to be rediscovered by a Jesuit Priest on Madagascar. Thus it would be a benefit to ascertain how those in the past dealt with water stresses and ascertain if such methods, like in rice farming, could be re introduced to current methods.

In addition to changes such as the System of Rice Intensification many other improvements may be made to water provision in the agricultural sector. With around 70% of all global water being used for agriculture, solving the

[893] Uphoff Norman, "Food Revolution That Starts With Rice", by Norman Uphoff, New York Times, June 17 2008

problem in that area would have the most impact to the water supply. Simple introductions of trees and bushes can reduce water runoff by 10 to 20%. Other practical solutions include: The monitoring of water in the ground, varying water provision depending on crop needs[894], adding organic mulch to reduce runoff, introduce crop rotation and increase owner and manager awareness.[895]

The reduction of synthetic pesticides and fertilisers would also greatly improve the water supply. Some academics argue that a return to organic farming would not only improve the water supply but, help to grow more crops. [896] Regardless of if there should be synthetic or organic farming used the amounts of chemicals used for example nitrates, can be reduced with the same farming results and a resulting cleaner water supply. [897]

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[894] Water needs vary immensely depending on crop type for example soil moisture for potatoes needs to be 25 – 50% /

[895] Pimentel D, "*Water Resources, Agriculture and the Environment" Bio Science, Report 04-1, 2004*.

[896] Pimentel D, "*Organic and Conventional Farming Systems*", Bio Science, 55 (7): 573-582. 2005.

[897]Howarth, Robert "*Fixing the Global Nitrogen Problem",* Scientific American, February 2010, p 32 – 39.

Global Privatisation and the World Bank

"*In light of a variety of related forces, including pressure from international financial institutions growing political momentum behind privatisation and deregulation and the sheer economic clout of multinational corporations analysts expect much of the increased spending to come from public – private partnerships*."[898]

"*Financing for water resources infrastructure is not cleanly separable into public and private sectors; increasingly, it requires public-private partnerships, both in investment and operation. While private investment and management are playing and must play, a growing role, this must take place within a publicly established long-term development and legal and regulatory framework and without crowding out community managed infrastructure and beneficiary participation in design and management of water systems."*[899]

[898] Douglas A Kysar, "*Sustainable Development and Private Global Governance*", Cornell Law Faculty Publication, Cornell Law Library, 2005.
[899] World Bank "*Water resources Sector Stratagem: Strategic Directions for World Bank Engagement"* 2004 (http://www.adb.org/water/topics/dams/pdf/WB-WaterStrategy-FullDocument.pdf)

Due to the current economic crashes and European financial climate many countries in Europe are pushing through measures to sell off assets, prevent further financial loss and improve efficiency in services. One way, in which this is being done is by the privatisation of publicly owned operations such as water. Portugal after electing a fiscally right wing government in June 2011 implemented legislation to sell off its water and other publicly provided services such as its national airline, energy provision and public transport. Although the privatisation of the water sector in Portugal does not come without economic and operational difficulties[900] these reforms are set to occur in the near future.[901]

In many countries academics have argued that structural reform including decentralisation and privatisation in countries such as Greece was necessary to create an economically viable country.[902] It has only been since the financial crash of 2008/9 that countries such as Greece have been forced by a combination of financial necessity and fiscal measures imposed by the European Union to privatise previously publicly owned services such as

[900] "Can Portugal Turn Water Into Cash" Global Water Intelligence, Volume 12, Issue 11 (November 2011): (http://www.globalwaterintel.com/archive/12/11/general/can-portugal-turn-water-cash.html)
[901] The Independent, 11 May, 2012
[902] Panagiotis and Staikouras, "*Structural Reform Policy: Privatisation and Beyond the Case of Greece*" European Journal of Law and Economics, Vol 17, No 3, 2004.

water. In 2010 the Greek Government announced that it would, " Sell 39 % of Hellenic Post (ELTA), 23% of Thessaloniki Water utility EYATH, and 10% of Athens Water and Sewage utility EYDAP, leaving the government will a 51% controlling stake in the aforementioned companies."[903]

From unions such as Europe to national organisations such as the World Bank, privatisation is being pushed on a global scale. The World Bank has promoted water privatisation as one of the best ways to '*manage an asset and make it function*'[904] The World Bank does however recognise that private participation in isolation is not the only answer to establish sufficient provision. " *While private investment and management are playing, and must play, a growing role, this must take place within a publicly established long-term development and legal and regulatory framework, and without crowding out community managed infrastructure and beneficiary participation in design and management of water systems. Attracting private investment into low-income countries is particularly important and necessarily a major focus for institutions like the World Bank."*[905]

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[903] Hellenic Government Ministry of Finance Web Page: (http://www.minfin.gr/portal/en/resource/contentObject/id/2f09efef-f916-4450-8236-de0606f1e12d)
[904] "*World Bank Pushes Private Water"* BBC, 14 August, 2003: (http://news.bbc.co.uk/1/hi/world/africa/3148837.stm)
[905] Water Resources Sector Stratagey, 2004< The World Bank

The World Bank's perception of the best operational system does not automatically make it correct, however considering that it provided 7.2 billion US Dollars[906] of money across the globe in water lending, the way in which it wishes money to be spent will obviously have an impact on water management at a global level. It supports both international privatisation and small rural private operators.[907] In addition as its Annual Report of 2011 illustrates, concepts such as sustainability and catchment management are now seen as an integral part of water provision. The World Bank not only support certain forms of provision but recognises the extent of the current water shortage and the pending problem of severe water shortage in the coming years and specifically the risks for the poorest countries.

"*By 2050, feeding a planet of 9 billion people will require a doubling of current water inputs to agriculture while increasing water efficiency. Much of the population growth will take place in the developing world, with urban populations in Africa and Asia doubling between 2000 and 2030. Another*

[906] World Bank Web Page : (http://water.worldbank.org/node/84014)
[907] Kleemeier E, "*Private Operators and Rural Water Supplies*" World Bank, November 2010. (http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2010/11/24/000334955_20101124053900/Rendered/PDF/578310revised01ous0record10rpostudy.pdf?)

impact of global expansion in poor and emerging economies will be the doubling of energy demand over the next quarter century. In addition, extreme weather will continue to destroy local economies (weather-related losses in 2010 were nearly $48 billion)… The poorest countries also face the largest risks. They have lower capacity to predict and recover from floods and droughts, and they are often the hardest hit by volatile food and energy prices. Water security is part and parcel of building the resilience of these countries to global crises."[908]

Conclusion

The problems which the word faces and will face in relation to the provision of water is arguably the most important current global issue as without water life would cease. Demand is increasing and supply is reducing without proper management at a national and an international level there will be a crisis like the world has never seen. The solution is yet unknown, one technological advancement such as a cheap way in which to desalinate saltwater would remove the problem almost immediately, but currently the future is uncertain. The way in which the resource is managed is more

[908] "*Strengthen, Secure, Sustain,*" World Bank Annual Report, 2012, World Bank.

important now than ever before and this it is essential for nations to evaluate the effective nature of their provision, and one provision which must be considered is private provision. Privatisation however has had mixed success and is highly controversial. Countries such as the Philippines have been leading the way in Asia towards effective and acclaimed privatisation.[909] Other countries have had less success such as Bolivia[910]. Privatisation is however not constrained to one model and should not be assessed in such a way. Great Britain can teach a considerable amount to those who wish to implement privatisation. The following and final part of the Thesis highlights certain elements that have enabled the systems in Great Britain to provide a effective provision as shown in the analysis of their systems earlier in the work.

[909] Dumol, Mark. 2000."*The Manila Water Concession: A Key Government Official's Diary of the World's Largest Water Privatisation*." Directions in Development Series, World Bank, Washington D.C.
[910] Mulreany J, et al, "*Water Privatisation and Public Health in Latin America*" Public Health, 19 (1), 2006
(http://www.scielosp.org/pdf/rpsp/v19n1/30220.pdf)

Part 3

The Elements which have aided Effective Provision

The system in England and Wales is effective. It is not perfect and it has concerns, which need and are slowly being addressed, but there are certain elements of its provision, which have made its effective provision possible.

Government Focus, and Political Will

Privatisation although not the original intention nor theory of the Conservatives became one of the pillars of their administration. There was political will behind privatisation and three consecutive terms under a majority leadership made the privatisation of so many utilities and other industries politically possible. In addition to the continuity of government there was the continuity of leadership with Margaret Thatcher as Prime Minister who continued with an economic philosophy of which privatisation was at its helm.

Water was one of the last industries to be privatised by the Thatcher administration. By this time most of the other large utilities including gas and electricity had been privatised. There was a strong political movement to privatise and the structure behind the privatisation was based on the privatisation of many previous utilities, enabling the privatisation to follow a structured and indeed practiced transfer. In addition to there being a legal structure for the privatisation the system of regulation was also an adaptation of other regulated utilities. Thus there was a formed structure, which had been tested in different forms previous to water privatisation.

Britain was in need of a solution to the growing debts of the country and the economic loss of utility provision. Privatisation gave Britain the opportunity to resolve its problems and increase (certainly in water) the effectiveness of provision. Privatisation of certain industries certainly was not popular among the various Trade Unions and employees, however discontent was not a force strong enough to prevent progress. There was political will and governmental ability. In addition there were no political or legislative restrictions, such as a veto from a superior legislative chamber, or a lack of majority in the House of Commons which could prevent the will of the Government to privatise.

Enforcement of Legislation (Enforcement of Regulation)

In addition to there being political will there was a massive amount of extremely comprehensive regulation governing the transfer of utilities from public to private. In addition to the Water Resources Act (1991) covering water quality and pollution it also provides a comprehensive structure for the management of the water resources, The Water Industry Act of the same year clearly states the duties and responsibilities of not only the corporate providers but their Regulatory Body.

The clarity and extent to which the legislation was drafted meant that although there have been many additions to the legislation the substance of the legislation and the duties and responsibilities of both the regulator and the regulated have not needed to be clarified nor the legislation structurally altered. This clarity meant that there was little room for ambiguity or uncertainty about what was legally required.

Capital Investment and Continued Maintenance

One of the main concerns of the global water industry lies not only in the provision but in the financial constraints related to effective provision and constant maintenance. Regardless of the massive amounts collected through taxation revenue since privatisation the industry save huge and essential capital expenditure, which would have otherwise left the Government with more national debt.

In addition to the capital infrastructure that has been supplied by the private sector, the providers are under a duty to maintain that system up to high standards. Not only is the maintenance a legal imperative for providers but it is in their financial interest to keep an effective system of provision as that is the most economical system of provision, for example it is far cheaper to repair leaks than it is to suffer the financial loss of those leaks.

Competition and Corporate Pressure

The intangible element of competition is very important to the effective provision of any private utility. This brings obvious complications in relation to the provision within a monopolistic region where one provider has complete autonomy.

Competition however has many elements in this system. Now with the introduction of inter region competition to non domestic customers there will be true competition where various companies can pursue the same customers in the same region. It is the case however that through Ofwat the companies and the extent of their effective provision is monitored by the regulator and if they are seen to be less effective than other regional providers then their prices and so profits are restricted in a bid to make them more commercial as a business and provide a better service for their customers.

Of course in such a system of regionalised monopoly there will never be the same form of competition as between companies that are selling movable goods as opposed to the provision of water. The competition or regional monitoring of the providers is only one element by which corporate efficiency is improved.

Corporate pressure is a major influence on how an organisation is run and provides a drive that a publicly run organisation cannot. This view was advocated strongly by the Chief Executive of Scottish Water, a public service, which endeavours to replicate the ethos of a private company. The pressure, which is placed on an organisation by the accountability to shareholders (or bond holders in the case of Welsh Water) is an intangible force, which produces self interested results which are visible in forms of capitalism across the globe.

Due to this vital but dangerous pressure to provide good financial results an industry such as water with such a vital nature must and does have a safeguard of regulatory supervision.

Effective Regulators.

The industry as previously described has a number of non-governmental quasi autonomous regulatory bodies with both strong and wide powers over the providers. Not only have these Regulators been divided into effective areas of supervision, for example the EA monitoring pollution and the DWI monitoring water quality, but they are on the whole respected by the providers.

Most importantly Ofwat has been praised by most of the providers and as a regulatory body which has the duty to balance corporate profit with consumer prices, which is very admirable. On the other side of the scales customer pricing although it has increased since privatisation, in real terms (considering inflation) it has dropped and if it were still in the public service it is estimated that the price would be considerably higher.

Through the K factor pricing formula (Retail Price Index + 'K' The Variable) of variable costs. Ofwat allows companies to finance the continual

improvement in their customer service (structural integrity, maintenance, quality) through, if necessary, service charge increases.

Corporate Transparency and Lack of Corruption

Great Britain unlike many countries is not know for corporate or legal corruption. This is most likely the product of centuries of structured legislation founded upon a respected and powerful base of civil servants. There is comprehensive legislation and valid and powerful regulators, but more than that the structure in which they operate is not sullied with bribery nor corruption. In certain countries there may be a situation where legislation is implemented and then ignored or there is both the legislation and the regulatory framework but corruption at a local, national and corporate level may lead to bribes being taken by the regulators or the government by corporate providers to either maintain concessions, provide concessions, overlook pollution or unnecessarily raise the possible price that could be charged. To date none of these situations have publicly arisen in England and Wales and nor is there thought to be corruption in the system.

In addition to the lack of corruption the corporations must by law be transparent (regardless of whether the majority of shares are held by foreign institutions) and are beholden to corporate laws of transparency. In addition they must provide various details of their future plans in the water sector to the various regulators ranging from catchment management plans to new capital developments and continued structural maintenance.

Improvements (Key Performance Criteria)

Environmentally since privatisation compliance with European Environmental measures has increased dramatically. Not only has the provision of tap water increased, but the way in which it is provided is more effective with more effective systems of purification. Leakages have also reduced across the country. Water provided as a utility is however only one element that has improved.

Environmentally the rivers, lakes and lochs have improved in quality which in turn has seen an increase in wildlife including salmon and trout in lakes and rivers which previously were too polluted for them to survive.

The quality of beaches is also an area, which has improved since privatisation. Once England was considered to be the land which held the dirtiest beaches in Europe but this title has long been lost.

The way in which catchments have been managed, without stakeholder participation and in a very disjointed and inefficient manner is one way in which the system needs to be improved. Doubtlessly there are and there will always continue to be areas which need to be made more effective.

Areas of Improvement.

This work has highlighted some of the areas where improvement is needed in the system in England and Wales, some of which are listed below:

Sustainable Development

The biggest area in which development is needed is in sustainable development and catchment management. Stakeholders such as land managers and owners, interest groups and governmental bodies were working independently and without any communication or unison. Since

recent reviews and the publication of a Government White Paper new practices have been implemented which aim to rectify previous areas which needed to be improved.

By incorporating non governmental groups such as the Rivers Trust as well as other interested parties in region specific and catchment specific projects a new form of holistic and sustainable management should hopefully be continued in the future. The system still has a great deal to achieve to rectify and fill previous cracks in the sustainable management system.

Prioritisation (Ofwat)

Ofwat holds a tremendous amount of power over the corporate providers. They decide the validity of corporate expenditure and its necessity. Capital expenditure and other such expenses when seen by Ofwat to be valid and necessary then warrant a rise in customer bills in order to cover corporate costs.

Ofwat has a duty under Statute to treat the advancement of Sustainable Development through corporate implementation as a legal duty. This duty is

and will remain a secondary duty and not be elevated to a primary duty. It is the case that although there have been problems voiced by corporate providers in relation to the spending allowed for sustainable development Ofwat's recent review has (although recognising the problem) not recommended any change. Thus a situation remains where Sustainable Development which many have initiated with corporate expenditure (and possible customer price increases) now may not happen, unless Ofwat deems that expense to be justifiable under their secondary duty.

Stakeholder Involvement with Regulators and Government

The Government, since its process of collecting information from various stakeholders, realised that the catchment management system was disjointed. Various stakeholders wanted to contribute to catchment management but didn't have the structure, the financial resources, nor the communication platform. Since the publication of the White Paper on catchment management several new initiatives have given both structure and funding to regional projects, which endeavour to create a variety of regional projects which incorporate the knowledge and abilities of a variety of stakeholders.

Ofwat however has been criticised for not incorporating various views of stakeholders into its decision making process. The original remit of Ofwat was not to do this, it was to regulate the price and monitor the companies and thus it should not be too harshly criticised for changing its remit. It is the case however that taking into consideration other views and stakeholders informed opinions may be a valuable source of information which Ofwat would allow to better understand the needs of the community. Thus further involvement with Regulators in particular Ofwat with a variety of stakeholders in their decision making process, would provider a more holistic base of information, through which their decisions would be derived.

Pollution and Flood Defences

The number of serious pollution incidents related to the water treatment industry had on average fallen since privatisation, but it has returned to roughly the same level since privatisation. This sharp rise in pollution incidents is monitored and punished by the Environment Agency and there must be continued scrutiny to ensure a reduction in the number of these incidents.

Not directly related to utility provisions but overlapping through the impact to pollution, flooding must be addressed. The Isle of Great Britain has suffered more through flooding in the past several years than is recorded in its history with many homes in England being completely flooded and many lives having been lost. These repeated and drastic floods are being addressed by Local Councils, but considerably more needs to be done in order to ensure that the water supply is not polluted and most importantly that future lives are not unnecessarily lost.

A Global Concern

The water problem is a global problem and different countries have made massive advancements in tackling the problem in their locality. For a global solution there has to be a dialogue between countries and as much information should be shared as possible.

One country, which has had massive challenges relating to the provision of water and successfully overcame these challenges is Singapore.

A World Bank Analytical and Advisory Assistance Program paper identified four elements to the success behind Singaporean Water Resource Management. These were: political will, integration of institutions towards public goals, enforcement of legislation and the use of advanced technologies. (Many of these can be seen in the Elements of Effective Provision for England and Wales above) The Report states " *From the 1980s to the 1990s Singapore made tremendous efforts to create a comprehensive environmental management system, including water supply, control of river pollution, establishment of well- planned industrial estates, and a world-class urban sanitation system for the whole island. More recently, the Singapore government has made 'sustainable water supply' the main target of water management, and a series of initiatives and actions has been undertaken. Singapore has achieved remarkable progress in water resource management based primarily on urban catchment management and water reuse. Its experience is valuable for other countries and cities facing threats to the quality and the quantity of their water supplies*." [911]

[911] World Bank Analytical and Advisory Assistance Program paper. "*Dealing With Water Scarcity In Singapore: Institutions, Strategies and Enforcement"* World Bank, July 2006: (http://siteresources.worldbank.org/INTEAPREGTOPENVIRONMENT/Resources/WRM_Singapore_experience_EN.pdf)

Singapore faced the challenge of water stress decades before many other large developed cities and has developed advanced solutions through necessity. Singapore recycles and reuses its wastewater and has a highly developed catchment system. Indeed two thirds of Singapore has been turned into catchment areas with 17 reservoirs, over 30 rivers and a highly developed network of more than 3,200 km of drains and canals to collect and store the rainwater.[912] As demonstrated by the Crete study, it may be the case that at a regional level public provision is efficient, but at a National level it is unsustainable.[913]

Globally countries must look to their neighbours and constantly assess and evaluate various methods to aid water provision. Countries could learn considerable amounts from the system of provision in England and Wales, but in turn England and Wales should look not only introspectively for National solutions but to the many countries who are also admirably finding novel solutions to comparable problems.

[912] "*Water Visionaries*" Alumnus, The Alumni Magazine for the National University of Singapore, April/June 2012.
[913] See Appendix 15 – Fieldwork in Crete. Where the region studied had an admirable water provision service which was effective at a regional scale but impractical at a National scale.

If a global solution is to be found then countries must not only make decisions based on their needs but on the needs of their neighbours. One Nation's solution could be the source of another Nation's problem. An example is the construction of dams in Ethiopia,[914] which could potentially cause great strife for downstream riparians.

Concluding Remarks

There is no panacea to cure the world of its water problem. The present problems of water provision will not be solved individually by new technology, management changes, legislation or political will and yet all these must play a role if the situation is to be resolved. Internationally there is a water problem if not a crisis, however at a national level the private provision of water in England and Wales can be called both efficient and effective. This system cannot be easily duplicated nor is it the solution for each nation to replicate. It is however, a system, which at a regional level is providing water, which is clean, available and affordable within an environment, which is being continually improved. If each nation were to achieve these aims then the current strains caused by water scarcity would

[914] *Steenhuis, T, Chapter 6 " Losing Paradise Options for Sustainable Water Management in Arid and Semi-Arid Areas".*

not be as great as they presently are.

There are many academics who condemn private provision and exclude this form of provision without using factual and statistical analysis as opposed to ideological debate. It is almost impossible to have no form of private sector involvement and the involvement may range from buying equipment made by a private company to having a system in England where the complete water provision is organised through companies guaranteed by shares. The debate however, should not be focused on private provision as opposed to public provision as emotions and ideology have and will hamper logical reasoning. This work has proved that privatisation can be an effective mode of provision, but this model is not necessary the form which other countries should copy, indeed the private systems in Great Britain are both different and effective. The focus should be on the needs of the country and the best way in which those needs, can be fulfilled to incorporate all stakeholders requirements. Should water be privatised is a loaded question and it should be seen to be an anachronism. Effective provision should be the target, with all forms of provision open for implementation including all forms of private provision.

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APPENDIX 1

Interviews and Site Visits

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NAME/ EVENT	ORGANISATION/ MORE INFORMATION	TITLE	MODE OF INTERVIEW	DAY
Dr Helge Daebel	Emerald Technology Ventures	Water Sector Specialist	Telephone	15 May 2010
Researching and working in Crete on water management.	For details see Appendix 10		In Person (Crete)	Months of July – August 2010
Disque Dean Junior	Water Asset Management	Executive Chairman	Telephone and In Person (New York)	9 September and 26 October 2010
Eric Thornburg	President and CEO AND NAWC President	Connecticut Water and NAWC (National Association of Water Companies)	Telephone	October 6 2010
April Davies	Water.Org	International Programmes Manager	Telephone	13 October 2010
Colin Skellett	Wessex Water Services Limited	Executive Chairman	Telephone	2 November 2010
Michael Fink	International Hydropower Association	Director of Business	Telephone	9 November 2010
Researching	For details see		In Person	November /

and working towards and during RELU Conference	Appendix 9		(USA and London)	December 2010
Martin Ross	South West Water Limited	Environmental Chief Manager	In Person (Devon - England)	23November 2010
Mark Holloway	Thames Water	Head of Business (Markets)	In Person (London)	25 November 2010
David Hackett	OFWAT	European Affairs Head Manager	In Person (London)	26 November 2010
Tour of the River Wandle with Hadrian Cook	Sailsbury Water Meadows Trust	Manager	In Person (London)	28 November 2010
Archie Ruggles-Brise	Association of Rivers Trusts	Director (South East)	In Person (London)	29 November 2010
RELU Conference on Water Catchment Management	Rural Economy and Land Use Programme (RELU) and various invitees		In Person (London)	29 November 2010
Workshop on Integrated Catchment Management	Various Bodies Present: EA/ DEFRA/ RELU		In Person (London)	30 November 2010
Martin Furness	OFWAT	Head Scientist	In Person (London)	30 November 2010
James Bream	Business Stream	Business Manager	Via Letter (reply received 1 December)	1 December 2010

James Bream	Business Stream	Business Manager		28 December 2010
Matt Diserio	Water Asset Management	Chief Investment Officer	Various extensive communications	October and November 2011
David Hackett	Ofwat	European Affairs Head Manager	Various extensive communications	October and November 2011
David Russell	Ofwat	Corporate Finance Senior Analyst	Various extensive communications	October and November 2011
Richard Ackroyd	Scottish Water	Chief Executive	In Person, Dumfries, Scotland.	9 March 2012
Lucia Susani	Environment Agency	Manager, Water Demand Management	Via Email (reply received 15 March)	15 March 2012
Georges Mougin	WPI (Water and Power from Icebergs)	Founder (Chief Executive)	Via Email (reply received on 27 March)	27 March 2012
Frances Mildmay	United Nations Association	Head of United Nations Association Scotland	In Person (Glasgow, Scotland)	27 March 2012
Loch Lomond – Site Visit	Iconic British Loch			2 April 2012
Loch Awe – Site Visit	Loch Awe has two hydroelectric schemes, (Turbine power and pump storage)			3 April 2012
Loch Katrine – Site Visit	(Largest Loch owned by Scottish Water – provides water to			4 April 2012

	Glasgow)			
Dr David Benson	University of East Anglia, Environmental Policy and The European Union	Senior Lecturer	Via Email (reply received 9 April	9 April 2012
Laurence Smith	University of London Centre for Water and Development	Senior Lecturer	Via Email (reply received 10 April)	10 April 2012
Richard Allison	South East Water	Financial Regulation Manager	Via Letter (reply dated 24 April)	24 April 2012
Geoff Loader	Southern Water	Director of Communicatio ns	Via Letter (reply dated 25 April)	25 April 2012
James Bullock	United Utilities	Director of Economic regulation	Via letter (reply dated 9 May)	9 May 2012
Kevin Whiteman	Kelda Water Services Limited (Yorkshire Water)	Chief Executive and Chairman	Via Telephone	13 June 2012
Tony Smith	The Consumer Council for Water	Chief Executive	Via Email (reply received 19 March)	19 March 2013
Lloyd Purnell	Which?	External Affairs	Via Email (reply received 20 March)	20 March 2013
Bruce Wilson	The Scottish Wildlife Trust	External Affairs	Via Email (reply received 25 March)	25 March 2013
Nigel Annett	Welsh Water	Founder / MD	In Person Cardiff Wales	17 April 2013
Professor Jeni Colbourne	The Drinking Water Inspectorate	Chief Inspector of Drinking Water	Via Email (reply received 11 June)	11 June 2013

Appendix 1

Interview with

Dr Helge Daebel

of

Emerald Technology Ventures

Seefeldstrasse 215, 8008, Zurich, Switzerland (European Office)

Office Telephone (+41) 44 269 61 00

Direct Telephone (+41) 44 269 61 25

Email helge.daebel@emerald-ventures.com

on

15 May, 2010

(This interview has been abbreviated to include the main points of interest.)

Interviewee Information

Emerald Technology Ventures is a clean technology venture capital fund and manages one of the largest clean technology portfolios in Europe.

Dr Helge Daebel, is a specialist in water technologies and is responsible for Emerald Technology Ventures' investments in these technologies.

Introductory Conversation, points made by Dr Helge Daebel.

I am passionate about water and feel that it is the most important sector in the world for investment, sustainable business and the wellbeing of all.

Why do you believe water (including water technologies) to be a good investment?

There are several themes why it is a good investment. It is a sector driven by a resource constraint.

Importantly there is a demand and supply gap. For example in China there is a very inefficient use of water, inefficient use exacerbates the demand.

On the demand side there is the hydrological and the quality elements. On the supply side there are new sources, desalination and reuse.

On the emission standards side of things the standards are more stringent for waste water, so this drives innovation besides the water purification you need to take care of is sludge, which is more difficult.

Infrastructure is also important to consider, there is never going to be more or less water. We should not look at it as a resource but a service, to have a functioning and affordable service you need an intelligent future.

What sort of water technologies are you interested in and why?

Membranes[915], because there is now a 'membrane mind set' to purifying water. You can deploy it in lots of treatments and all types of water.

We are interested in technology not processes.

We are also very interested in the treatment of waste water and sludge, for example technologies that reduce the sludge produced are very interesting to us (Emerald Technology Ventures).

Network management software is interesting and other software related tools such as software that monitors energy consumption and water pressure.

Desalination is another area of great potential growth and there are various desalination approaches.

What would you look for in water companies for potential future investment?

When choosing a potential investment it is similar in all industries. There are several points that are very important such as looking at the adoption cycle and the exit.

[915] Membranes as explained by the University of Utah (Health Department); 'Control the structures and environments of the compartments they define, and thereby the metabolism of these compartments.' As found: http://library.med.utah.edu/NetBiochem/membrane.htm

The management of the firm is very important.

The stage that the company and how the current management fits with that stage is also very important.

A company must have a sustainable business model.

If the company is focused on technology then it must have the appropriate intellectual property agreements in place including patents.

The company must be appreciated by the market.

Also the company must be willing and ready to adopt a quick and willing cycle of production.

In what way do you see the water market changing in the future?

The adoption cycle will only continue to get faster and companies as they start to adopt new products will be looking for the next stage of advancement. I have seen products that would have several years ago been given manufacturing times of five to six years now being given times of six months.

All the investments that we invest in we want to see an exit strategy of around five years, for example an acquisition. It is the case however that each business is different.

How do you think the change will have an impact on both the large internationals and the smaller providers of both water and services?

Large companies will have to become more dynamic in order to compete with the smaller more dynamic companies. Both small and large companies will also have to have dynamic business models.

Smaller companies can have the advantage of possessing quicker adoption cycles.

The private sector in one way or another is bound to expand. The private sector can reduce OPEX[916] and CAPEX[917] and are more efficient at running businesses.

To what extent do you think that water will be viewed as an international commodity in the future?

[916] OPEX is an accounting term and is an abbreviated form of stating a running or operational cost, for example an ongoing cost of running a product, wages and research costs. As defined in the Financial Dictionary: http://financial-dictionary.thefreedictionary.com/OPEX

[917] CAPEX is an accounting term and is an abbreviated for of stating a capital cost or fixed cost, for example the purchase of a fixed asset.

I don't believe it is a term that fits to water.

From a chemical perspective it is a commodity.

Water is a complex resource with different dimensions, emotional and economic.

Can you think of any potential threats the water industry may face?

You can see the constraint on the resource and the financial means and the demographics of the population.

You can see this as a threat or as a challenge to supply the demand

As a trained Engineer how did you enter water investment?

Sector specialists are a needed commodity.

A good business needs to have specialists.

Specialists are able to spot the deals, to spot the opportunities and the business plans and quick fashion.

I understand what others who are 'multi sector specialists' don't.

Currently 15% of our business is water, but that will grow.

Appendix 2

Interview with

Disque Dean Junior

Co Founder and Executive Chairman

of

Water Asset Management LLC

509 Madison Avenue, Suite 804, New York, 10022, U.S.A.

Telephone (1) 212 754 5132
Mobile Phone (1) 917 213 5478

Email d.dean@waterinv.com

on

9 September, 2010

(This interview has been abbreviated to include the main points of interest.)

Interviewee Information

Water Asset Management LLC is an asset management company (Hedge Fund) investing only in the water industry.

Introductory Conversation

What the private sector can do is to provide sanitary services where the public sector has failed to do so for example in Brazil and in Thailand. In Thailand, the Manila Water Company[918] is a good example of this and a company that we (Water Asset Management LLC) have invested in. Companies like this can completely transform shanty towns and provide essential sanitary services.

Many private companies will go in and provide water to remote regions on the basis that if there is non payment then the water will be cut off within 24 hours.

[918] '*Manila Water Company, Inc. holds exclusive rights to provide water delivery and sewerage and sanitation services under the terms of a 25-year concession agreement to approximately six million people in the East Zone (the East Zone), comprising a range of residential, commercial and industrial customers. The East Zone encompasses 23 cities and municipalities that include business districts and residential areas in the eastern part of Metro Manila, and the adjacent Rizal Province. As of December 31, 2009, the Company supplied 396.0 million cubic meters of water and distributed water to more than five million persons in the East Zone through approximately 1,086,296 household connections. The Company also manages and operates the sewerage system that covers a portion of its service area, as well as provides sanitation services including regular maintenance of septic tanks*.' Manila Water Company is a Thai Company (MWC.PS) details taken from Reuters: http://www.reuters.com/finance/stocks/companyProfile?symbol=MWC.PS

The provision of water is an act of man. If people want water piped from a source to their home they have to understand that it is manpower that does this and that someone will have to pay for that manpower.

Future investment will be in water and wastewater. Indeed water is so valuable that the term 'waste water' will become obsolete.

Privatisation is the future, indeed investing in these companies is the future.

Water Asset Management LLC have 'just' taken South West Water[919] into Private ownership.

From the area of privatization there are three models; The US model based on return, the British model based on pricing to the customers and the model in Chile which considers the profits and costs in cycles of every five years.

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[919] 'SouthWest Water Company (SouthWest Water), incorporated in 1954, operates and maintains water and wastewater infrastructure. Through its operating subsidiaries, the Company owns 144 systems and operate hundreds more under contract to cities, utility districts and private companies. During the year ended December 31, 2009, the Company was organized in four segments: Utilities, Texas Utilities, O&M Services and Texas MUD Services. Its owned water and wastewater utilities are referred to as its Utilities operations. At December 31, 2009 the Company had approximately 109,000 active water connections and 21,000 active wastewater connections. Approximately 95% of its connections are to residential customers.' South West Water Company is an American Company(SWWC.O) details taken from Reuters: http://www.reuters.com/finance/stocks/chart?symbol=SWWC.O

There are benefits and drawbacks for each model, the British model for example is too heavily leveraged. That being said companies such as Yorkshire Water[920] have been around for hundreds of years and they are not going anywhere.

In the private sector there are very few industries that deal with companies that have been around for hundreds of years, the exception being in the military business.

Why do you believe water (including water technologies) to be a good investment?

It needs huge amounts of capital to start a water company and there is a significant amount of capital already in many companies. Not only this but the more money people have, the more they spend on water. In developing countries one quarter of income is spent on water, in developed countries it

[920] Yorkshire Water is part of the Kelda Group limited (previously Kelda Group plc – which was taken private by Saltire Water in 2008) which is a British utility Company. Yorkshire Water provides 1.7 million households and 140,000 businesses with water and sewerage services. Kelda Group limited details taken from Kelda Group webpage: http://www.keldagroup.com/kel/about/

is less than one percent. As wealth increases so does spending on water (although percentage spending decreases actual spending increases).

Water is still one of the cheapest utilities and it has a lot of room to grow.

These are not businesses that are going to go out of business.

There are very few water companies and they are very low risk.

The companies are very similar, it is easy to study and compare a water company in one country to another.

There are huge possibilities for consolidation.

There are not enough people in the industry, this is attractive from the business point of view.

They (Water Companies) have compounded at zeros of 10%, this is way above the market norm. For long term investment this is a good area to be in.

Water investment is a long term investment, but a profitable one.

What sort of water technologies are you interested in and why?

The water energy nexus is an area where people will focus on the immediate future. As water gets more and more expensive then leakage will become a bigger factor if you lose water you need more energy. Water saving technologies, using and capturing rain water more effectively will become more and more important, for example buildings that capture and use the rainwater will become more common.

There are also some filtration projects, which are also very interesting.

It is very hard to invest in new technologies.

Companies such as Energy Recovery Inc[921] developed from a $25 million dollar company to a 600 million dollar company because there is a need to save water.

[921] '*Energy Recovery, Inc., incorporated in April 1992, develops, manufactures and sells high-efficiency energy recovery devices and pumps primarily for use in seawater and brackish water desalination. The Company has one operating segment, the manufacture*

To what extent do you see desalination as a solution?

Desalination is a part to the solution – in some areas it is more important, than others. Desalination it is still going to be very expensive. If water would have to be transported then it would not be worth the cost.

Also one has to consider where the most expensive real estate (property) in the world is. The most expensive properties are next to the sea and they would not want a desalination plant next to them.

Most water systems are gravity fed, to work against that is a bad business principle.

Desalination is not the issue - not even close to the issue.

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and sale of high-efficiency energy recovery products and pumps and related parts and services. On December 21, 2009, the Company completed its acquisition of Pump Engineering, LLC, which was renamed Pump Engineering, Inc. (PEI). PEI develops and manufactures energy-recovery devices, known as turbochargers, and efficient high pressure pumps for brackish and seawater reverses osmosis desalination.' Energy Recovery Inc (ERII), details taken from Reuters: http://www.reuters.com/finance/stocks/companyProfile?symbol=ERII.O

One of the main problems in poorer countries is that their governments do not want their poor to have water. When you give them water you challenge the social structure. Young females need to get water it takes them hours each day. If you give them water you give them free time and then they would get an education and some people fear that liberation.

The governments have a cheap force of labour, this is the reality.

Poverty is a business for some people.

What would you look for in water companies for potential future investment?

Management (Good strong management).

Dependable franchise (A solid and strong company).

Water utilities (Mainly water utilities and related industries).

The water industry is a dependable one, people will still be using water and flushing toilets in 100 years – that is dependable.

The reuse of waste water is always a growing industry and with current shortages it is an industry which will only grow.

In what way do you see the water market changing in the future?

The consequence of budgets being constrained is currently having an impact on the sector, as it is on the economy as a whole.

In the future there will be a significant growth in privatisation.

Privatisation can and does mean different things to different people for example in Brazil 49.99% of a company may be floated on the market with the government retaining the majority share and therefore the control.

There will also be an increase in price, currently water is provided at a very cheap rate. A good example would be that individuals would be able to tell an inquirer how much they pay for gas or electric, not water.

Price will also increase because it can. An individual is and will be willing to pay for a company to clean their toilets and drains.

How do you think the change will have an impact on both the large internationals and the smaller providers of both water and services?

There are always going to be waves of consolidation. There will be more horizontal consolidation, but there will not be much vertical consolidation.

Large companies need capital and more companies will go public to raise the capital that is needed.

To what extent do you think that water will be viewed as an international commodity in the future?

The price of water can only ever be locally defined. It will not be a commodity like rice, oil or corn.

Can you think of any potential threats the water industry may face?

The reality is we all go to the bathroom, people would pay a lot for a company to take care of those issues.

In short I can foresee no real problems in the future.

Even where there has been bad press about the private sector such as in Bolivia the coverage has not been fair and indeed one of the reporters who covered the Bolivian water affair has now come out and said that what he documented was not a balanced and fair viewpoint of the issues in the country.

Appendix 1

Interview with

Eric W Thornberg

Of

The Connecticut Water Company

Chairman, Chief Executive Officer and President of The Connecticut Water Company

And

President of The National Association of Water Companies

Telephone (001) 860 669 8630 ext 3008

on

6 October, 2012 – Via Telephone

(This interview has been abbreviated to include the main points.)

Interviewee Information

Connecticut Water is a private provider of water to 300,000 individuals in 55 towns in North East America.

NAWC is the industry association for water companies across America.

Why do you think that a private company can adequately balance the provision of service to the customer and optimise its profits?

I think the key here is optimising not maximising, we run an efficient organisation. Private companies can balance and can achieve efficiencies, you have to attract capital, the best way to do this is to provide a return in the investment in the company. It is a long term venture, if I run CWC, which is extremely profitable then the customers will loose trust, so it is a very stable investment, if they are slightly more than a bank then you can get investment and get a reasonable return, building trust with the customers is very important.

The business model works very well. A number of state run companies have no incentive for efficiency, they do not attract new capital, although the rates may be lower the assets are starved of investment.

In the US the EPA (Environmental Protection Agency) governs drinking

water quality. Now they are obligated to produce new regulations every five years, but it should really be based on science and understanding. The Safe Drinking Water Act did some very valuable work, it could be enhanced or improved though.

In terms of the price that is regulated by a State Public Utility Commission and I do think there are a number of state regulators that should be improved.

Many think that the private sector should not be involved in the provision of water, what would you say to those individuals?

Lets remember that CWC is a private water company, but we do not own the water. We have a right by the state to provide it.

It is regulated from the source to the tap, we cannot misuse or withhold with regulatory practices, there is no difference between a public utility and private.

A combination of a public service and a private enterprise is a very

powerful model

In a government utility, people may vote in a town council and they are not experts. A mayor does not want to be remembered as the one who raises the rates for water. They are not being good stewards, they are leaving it for the next generation to solve.

Think about transparency. I have to disclose everything about the organization (CWC) You would need a freedom of information request for the city of Chicago or a governmental run water department.

There are examples of coca cola abusing water in certain places that is wrong.

In private organisations there is a lot more innovation and creativity. The need to be efficient and effective is essential. Corporations invest in people, in the community and into the infrastructure of the supply.

What additional value do you believe that Connecticut Water can provide that the state cannot?

Additional access to capital markets, we can raise money, they raise for the debt markets, we can sell equity or stock, that opens up a whole new universe!

Again I am also accountable to a shareholder, that is also very important.

Do you believe that the private sector will increase its hold in the provision of water nationally and internationally, if so why?

I remain convinced that it will. There are some ebbs and flows, in the last few years there has been suspicion and concern but governments are effectively broke, the financial realities and the constraints of the world that we live in will compel them to privatize. It is a compelling model but overcome by hysteria.

I do think you will see smaller privatizations. In addition the components will be divided for example supply from waste and leak prevention services.

How do you think the industry will change in the future?

There will be more of this blending of public and private. Public don't have to pay tax on the earnings, private utilities seek to offset that advantage by being more efficient and effective.

There will be more of the smaller scale privatisation work. I think you will continue to see acquisitions of smaller companies. The buying up of water systems will continue, there will be a movement towards fragmentation, our country is vast compared to the UK.

Ofwat monitor performance in the UK, this is envied here, the UK is good system.

In California 18% of energy generated goes to moving water, by being more efficient would have obvious advantages.

Also help the customer to use less water, provide information – not just buill based on the gallons, people will expect us to lead in this way.

Like a tv you build different levels of service. If you could do that with

water that may be better, a poor household may just want for sanitation. Now if a rich family want to do gardening then there would be a higher rate.

What new technologies do you think will be introduced in the future?

The electric industry, smart metering on a minute by minute basis. A system where all the customers meters can tell you what is needed, you may be able to directly communicate with the customer, directly in relation to leaks etc.

One new innovation is an acoustic device it listens for leakage. If we are hearing a sound, there is a leak.

Do you see any threats that the private sector may have to deal with?

The threats are the same, the Maude Barlows and those working groups that want to condemn the industry. Also sometimes governments treat private companies differently from public.

Also sometimes people presume that because we provide water that we should not make a profit.

Environmental Stewardship appears to be a large concern of your organisation , for what reasons do you find this important?

Water utility operators are environmentalists, they do not like pollution. Pollution needs to be dealt with, we have strong belief that our customers will trust us the more we reduce pollution.

I am concerned that people will say this is too important. I want to be a leader. We are driving the change. My employees really care about the environment, as do I.

I want the customers and regulators to trust us.

Are there any laws or restrictions that you would like to be passed or reversed that would impact your business?

I can raise rates every year. If you hit the metrics you can get additional revenues.

One thing in the US right now under the tax reductions due to expire – changing the rate – utilities rely on 15% relief. If that tax rate was altered dividend would go to 30% tax.

Looking into the future what do you think will be the most important area in your business and is that different to the present?

Capital investment is the key that is no different to the present. For that to occur we have to educate the customers. If they view water as a commodity and they don't understand the provision then there will be a lot of resistance. We have to develop and tell our story to them.

Also workforce management. It is difficult to attract people into a water plant, we have a lot of people leaving the industry.

Appendix 1

Interview with
April Davies

International Manager

of

Water.Org

Head Office: 920 Main St. Ste. 1800 Kansas City, MO 64105 USA

Telephone (001) (0) 816 877 8433

on

13 October, 2010 – Via Telephone

(This interview has been abbreviated to include the main points.)

Interviewee Information

Water.org is a non profit organization that has transformed hundreds of communities in Africa, South Asia, and Central America by providing access to safe water and sanitation.

What do you consider the root of the water problem?

There are two roots, one of them is that there is water but there is no access to the water. The other is that there is plenty of access but the resources are not there. So in either circumstance the poor don't have the water – either because they can't afford it and don't have it.

48 countries in the UN have water stress and water scarcity. This will only grow.

In what ways do you think the problems could be solved?

In the case of lack of access, one of the ways is in communities organising to obtain the water. That is easier said than done!

In terms of water scarcity new technology could be used and cooperation. There should be less conflict with water, whether there are two governments or two communities there needs to be cooperation.

What has been done in the past that must not be done in the future?

From my point of view I took this from a community angle, projects without community input, people have to own (or feel they own) the infrastructure.

New technologies should not come from a laboratory in another country, but from where they are being implemented.

A lot of water companies have done a good job but there is still corruption.

Focusing only on wealthy will not help, we need more pro poor strategies.

What has not been done in the past that must be done in the future?

More capacity building as in water plants and more management, people have a grasp of what to do but people need to learn how to manage.

The service providers and the government officials, these are often complicated relationships that need to be improved upon.

How do you view the private sector?

I think that the private sector has a role in the problems and the solutions.

There are numerous in private sector assisting the problems, for example the building of a plant in an area where there is no plant. In situations like this the community benefits.

The possibilities are endless with the private sector.

Technology given by the private sector such as mobile phones can be used to relay information in relation to the hygiene of toilets or a water supply for example.

In countries that are still developing they skipped land lines they have cell communication companies and they could and do team up with other companies such as water companies – the possibilities are endless.

We work with the private sector to provide water credit also.

The private sector also comes up with new technologies which is vital.

Do you think the private sector could help solve the water problem?

There is lots of money in the private sector. They fund water improvements.

They could also be a champion of the water cause.

In what way do you think there will be a change in the water distribution?

There is lots of aquifer drainage taking place. I think that aquifer drainage will be an issue in the future. The Rio Grande for example.

What is the biggest threat to water at present?

There are several: Climate change, Politics, International Conflicts, Pollution all of those at a Macro level.

At a micro level: Access, Availability, Pollution

Do you think there is a positive outlook for the future or a negative?

Very optimistic in the field that I work in. There are new methods for assisting communities to gain access. Also utility companies are starting to reach out to poor communities in slums in the cities.

Maintenance will be very important in the future as it is now.

What roles do governments, corporations and individuals play? What should they do and stop doing if we wish to resolve the water issues?

It takes all of the stakeholders to make something successful.

Governments need to have good laws and no corruption. Governments can also have a voice, to have to recognise water is a basic right.

At the same way corporations can play a role in this with education and awareness and taking action.

In some cases the corporations take the role of governments.

On individuals managing their own water, it hard to say what an individual role is, awareness and education is so important. This should be organised at a community level.

How are you (water.org) funded?

We are a Non Profit organisation. We receive money from donations from individuals, corporations and governments.

Appendix 1

Interview with

Colin Skellett
Executive Chairman
of

Wessex Water Services Limited

Registered in England No. 2366648

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on

2 November, 2010 In Person

(This interview has been abbreviated to include the main points.)

Interviewee Information

Wessex Water Services Limited is the regional water and sewage treatment business serving an area of the south west of England, covering 10,000 square kilometres including Dorset, Somerset, Bristol, most of Wiltshire and parts of Gloucestershire and Hampshire.

Why do you think that a private company can adequately balance the provision of service to the customer and optimize profits?

I think the key to this is effective regulation, as it is the regulation that provides the balance. In England regulators set the standards and set the appropriate cost of capital and they set the prices that can be charged to the consumer. Within that framework the company makes money on the base return that is allowed by outperforming.

Many think that the private sector should not be involved in the provision of water, what would you say to those individuals?

Water is across the world provided privately, but across the worlds there are different models. In some cases the public sector is in partnership with private companies. If there is the right framework the private sector will run the provision more efficiently.

Why do you believe that privatisation in England and Wales has succeeded?

Here you have to go back to why did privatisation take place. It happened because the public sector could not provide the capital needed. The water and the sewage sector were always at the bottom of the list of where money was to be spent by the government. The reason is happened was to get access to private funds. When it was privatised, there was an enormous injection of private capital, which has lead to much better standards, much better customer service and significant improvements in efficiency. This is due to the financial model.

Do you support the role of OFWAT?

It is interesting you ask this because Ofwat is under a review at the moment.

OFWAT principal role is to do with prices. In the future it will have to consider the long term sustainability of services.

We have got to have a long term focus on the provision of resources.

OFWAT will have to shift – so that things are being delivered in a long term way.

Catchment conservation has in the past reportedly been restricted by OFWAT – have you found them to restrict this or any other environmental action you wished to take?

It is two things: is there enough money going into the infrastructure, also does it encourage sustainable solutions.

Pesticides and nitrates commonly flow into the water system we can build treatment plants or the sustainable solution is to work with farmers.

In the future OFWAT will have to recognize the sustainable solutions.

If OFWAT were to do something differently what do you think it should do?

This links into the previous question. OFWAT has been good at controlling prices, now it must look beyond that.

What new technologies do you think will be introduced in the future?

There will be a combination; there will be more on catchment management, and also an increase in new technologies.

Pollution will be resolved in new ways, for example membrane technologies will be used more than chemical treatments.

We are seeing much more focus on renewable energy.

There are however as of yet no 'magic technologies'.

Can you think of any potential threats the water industry may face?

The biggest threat will always be political and regulatory uncertainty.

The biggest threat is debt, gearing is 70 to 80% in most companies. The debt providers are always concerned if the regulators make the wrong noises, we can't frighten off the investors.

Also climate change, whatever you believe, is a challenge not a threat.

We are getting longer hotter drier summers, this will have to be considered.

Are there any laws or restrictions that you would like to be passed or reversed that would impact your business?

At the moment we are not allowed to disconnect those who do not pay. We find people payment schemes. If there are people who ride the system, we should restrict the flow (to those who are riding the system).

As economic times get harder then people begin to learn this, that if they don't pay then we can't shut off their water, this should change. We should be able to reduce the flow to those who simply decide not to pay.

Appendix 1

Interview with

Michael Fink

Business Director

of

International Hydropower Association

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09 November, 2010 – Via Telephone

(This interview has been abbreviated to include the main points.)

Interviewee Information

The International Hydropower Association is a non for profit international organisation with representatives in over 80 countries. The aim of the organisation is to advocate and aid the use and construction of hydropower.

Why do you think that hydropower can adequately balance the provision of service to the customer and be considered as aiding sustainability?

This is essential to the mandate of our organisation to actually do this. We believe in sustainability and the concept of it to be at the heart of social economic issues and yes hydropower will provide a service and it is to make sure it is run in the best possible way.

In the UK context it is the sustainable management of the plants which is most important. When it comes to new hydro plants it is identifying which should and should not be constructed and developed and when and how a river should be protected.

When you consider what should be considered in aiding sustainability is it more or less sustainable than a coal or wind. We are developing methods to make it the most sustainable but like everything there are pros and cons.

Many think that the private sector should not be involved in the provision of water or profit from its use, what would you say to those individuals?

An argument that is always raised is the distinction between taking a profit and using it as a resource you need to licence operators to make it available. What I would say is that it is fine if a private sector entity makes a profit. You don't sell the water as such on a hydro context. If you then are doing a good business in being efficient, then I would not have an objection.

Water has a lot of cultural norms attached to it in some countries it is acceptable in others it is not at all. It might be related to the scarcity of the resource.

IHA does not have an official line in this. One needs to distinguish between the ownership and the provision of the utility.

What additional value do you believe that Hydropower can provide that other technologies cannot?

There are two main things; cost and storage. In terms of comparing renewables, it is by far the most cost efficient, on a global scale it is by far the most renewable energy, its cost is much cheaper.

Storage is the other big advantage. Hydro plants have detachable towers, as opposed to wind or sunshine. In the electricity system as a whole demand and supply can be balanced through these towers.

Do you believe that hydropower will increase nationally and internationally, if so why?

We are working globally to do this. The typography has to be right however.

There have been massive increases concentrated in China. There are however gaps in development in South America in countries like Brazil.

How do you think the hydropower industry will change in the future?

This is quite context specific, we would hope that global development would increase, there are large Chinese developers in addition The technology itself will mature.

What new technologies do you think will be introduced in the future?

The technology is probably around marine energy, especially with marine currents. These are in the early stage of development so far but tidal is also very important.

In some places like central Europe it will be around optimising technology and making it more sustainable, in Africa it will be attracting finance and building the capacity for a regulatory framework. In Asia the capital is available, here development should be focused on finding a regulatory process where there is a plan and then give licenses to develop the private sector, this is much better.

In Brazil it is a governmental planning process, the government determines why and where, then it gets put up for auction it is good for a system planning perspective. But even in this system there is a problem, the private

system argue that they would plan where and why better, so there is an intellectual and practical challenge.

Historically hydropower was developed by the public sector. It is very capital intensive. Once the initial large costs have been made it is economically viable as the costs are low to operate. It can be very profitable.

Do you see any threats that the hydropower sector may have to deal with?

An issue that will only grow in complexity is when large firms operate trans boundary systems.

The main threats in addition to that is that it is perceived as being seen as unsustainable. There are different things and different countries, large scale re-settlement, not only in China but also in Vietnam, you have issues around this, the arguments come in waves. There are a lot of these discussions and the sector tries to respond to it.

Are there any laws or restrictions that you would like to be passed or reversed that would impact your business?

Two things one comes from the energy side you should note that this is not a IHA position. We need a clearer focus on climate change. My private position is that we should just have a carbon tax.

The other is the Water Framework Directive. There is an emphasis to get back to the natural state of water bodies, but how this will affect the development of new hydro? It is unclear.

Looking into the future what do you think will be the most important area in your business and is that different to the present?

This will be a possible backlash on the industry with the debate for sustainability taken a certain way.

There was a period where it was negatively affected in 2003 – 2004. Hydropower developed a bad reputation in the past but now China and

Brazil have developed so much, the future and the developments will be considerably different from those in the past.

Appendix 1

Interview with

Martin Ross

Chief Manager of the Environmental Division

of

South West Water Limited

Registered in England No. 02366665

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on

23 November, 2010 – In Person

(This interview has been abbreviated to include the main points.)

Interviewee Information

South West Water is part of the Pennon Group. It provides water and sewage services to several areas in the West Country (England), which include Devon and Cornwall. It provides water and sewage services to around 1.6 million customers.

In your opinion why was water privatised?

A whole set of new environmental standards were being set from the mid 1970s onward and those started to apply to the UK and the UK had the duty under the legislation, to apply international law.

Water was a part of the Department of the Environment. It had to make decisions to apply the new legislation and that was in competition with the rest of the demands of the department. With the EU rules, it was a tidal wave of new standards. It could not change in time or alone.

So privatisation was considered. In 1987 Thatcher was the Prime Minister at the time, there was an extensive regime of privatisation. The water industry was one which they (the government) felt could be privatised.

The EU imposed legislation on drinking water and bathing water Before privatisation we only had 30 or 40 beaches that were safe for bathing, we were not keeping up with the new requirements and the industry was under funded and old fashioned.

Was privatisation either needed or did it benefit the industry and why?

It my view it was essential because there was no alternative to raise money and deliver improvements, the alternative would be to fail and be fined by Europe. It was essential.

The industry is set up in a completely new direction. Through the process of 5 yearly price reviews, it has completely transformed what was happening in the 1970s.

How do you think the industry changed?

It changed from a local government function, which was set up in 1974 through the Regional Water Authorities, these were based in catchment boundaries. All the time they were restricted on their funding, the last years before privatisation they had to spend more than could raise!

The industry needed to spend, and privatisation allowed the industry to raise money and spend money.

Water companies wanted relative freedom and privatisation allowed that.

How did the change affect employees and what was expected of them?

The general rule 1/3 thrive 1/3 survive and 1/3 go away. A lot of changes were made the employment regime was changed. You had payment by results, share incentive schemes, bonuses. In exchange for that more liberal regime, you were demanded to provide the goods. Quite a lot of the employees grew in a gentle atmosphere, so many took retirement, you could leave on your 50th birthday, your pension was made up (to retirement age) and inflation was added it was very generous.

Since then it has been a process of rationalising numbers, change is now a constant ongoing process, in this company we prefer to have a constant evolution of what people do continually adapting to new pressures.

This is better than having everything special for three years and then having a night of the long knifes when people decide to leave.

Why do you think that a private company can adequately balance the provision of service to the customer and optimising profits?

A private business has a sole duty to maximize the profits, as stated in the Companies Act. The most recent Companies Act has applied an equal duty to maximize profits without long term damage to the environment.[922] This has been a big help for corporate responsibility to do the right things for the long term.

Ofwat was set up for comparative regulation, to rank in terms of efficiency and service and Ofwat specifies what standards companies should meet and set penalties and rewards. The rewards are based on company reputation and financial awards. Ofwat's central role is in the customer's interest. It has measures, which are appropriate and comparable across the country.

There is an EU directive to require free competition.[923] Anti competitive

[922] The Companies Act 2006 : (http://www.legislation.gov.uk/ukpga/2006/46/pdfs/ukpga_20060046_en.pdf)
Note – Mr Ross was correct in stating that there is a duty for corporations to take into consideration factors such as the environment. For Example Section 172 and 417 give specific to the regard that should be given towards the Environment.
[923] Commission Directive 2002/77/EC of 16 September 2002 (on competition in the markets for electronic communications networks and services):

rules and anti competitive behaviours would incur massive fines. In water there is not a level playing field, the owners have a massive start over new entrants, two companies can be providing the service, they would then share a pipe if there is a failure then both businesses will be equally to blame, normally you have to prove one is at fault.

It [The water sector in relation to competition] is making progress the wholesale activities are being run by Scottish Water for non domestic customers successfully.

It is not economic and possible to send units of water cross border or long distances, the cost is unsupportable, the capital moving costs and heavy nature of the product prevent it.

The answer for water supply is to collect it locally and supply locally. Don't imagine someone in Perth (Scotland) can buy water from South West Water in England.

(http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:249:0021:0021:EN:PDF)

Competition is great but you have to understand the physical attributes.

Water is life and free water is freedom.

Many think that the private sector should not be involved in the provision of water, what would you say to those individuals?

In 1985, The South East Water company looked back into history and why people were resentful. It went right back to the middle ages, the source of life was a village well. There are two things that could go wrong, one is poison in the well and second was to privatise – and charge for a free common good. For all of our sophistication, people still think it is a free entitlement and that it should come as a social service, this is a deep emotional block and a relationship, it makes it difficult, their concern was that people were taking advantage of individuals as a monopoly to make profits for shareholders. It is a mixture of lack of trust and envy and suspicion and a feeling of powerlessness.

The positive side is that for the private sector to be involved you need a structure. You need to have investment to catch up for past neglect, customers have to be wealthy enough and the government has to be brave

enough.

In other countries you either have unwillingness of customers or the government. In other countries, where you have privatisation, you will have people digging up the water pipes!

If you have the right social and government positions, then the private sector is better.

We are focused, there are no half measures you do or die and that applies on a personal basis, right the way up all the organisation. As an engineer it needs to happen, it has to happen for people's welfare for the good of society and the legislation needs to meet the aims.

The EU said it should be the right of every EU citizen to swim in the sea, this was a starting point of new legislation.

When Mrs Thatcher came into power, we had 40% of the sewage going into the sea. We were the dirty man of Europe, in that regard especially in relation to our beaches.

Previously there were no votes in sewage so those points were politically at the back of the queue.

Why do you believe that privatisation in England and Wales has succeeded?

Because the government has not lost its nerve.

There has been a big investment and it assumed the investment need would fall away, but new obligations keep coming up and the funding is continuing.

And it would have been a complete failure without Ofwat.

Some have said that river catchment management has suffered and indeed that environmental measures have been restricted by OFWAT - do you have any information here?

It exists because we are still formed on the catchment boundaries.

Environmental measure are still focused on specific parts of the environment. They focus on the control of sewage and abstraction from the rivers, on our service to customers. It does not look at a wider aspect, which should look at the river catchments. Each industry looks at environmental concerns independently and does not look at what other industries actually do, so most companies still think of an asset base and services to provide and the fact we need permission to do certain things - this is a one dimensional primitive water industry behaviour.

We have external challenges including:

Drought

Flooding

Climate change

Excessive runoff (phosphate and nitrate)

Hotter winters

Algae problems (with warmer winter)

Farming more Intensively and pollution has increased in the industry.

What needs to be done?

We need to have an alliance with the land management. Keep the fertilisers on the land not in the water!

Our brand is called ‘upstream thinking’, control the asset base and look at the wider environment.

The more the water is polluted the more expensive it is to treat.

Clear water will cost 20% less to clean. A lot of the chemicals now were waste chemicals, aluminium sulphate etc, very simple compounds are easy to clean, now you need more complex chemicals to deal with the more expensive fertilizers mainly made in Germany.

We need to take a wider view on management which will reduce pollution and save money.

If we look at the present day value, there is a huge value in investing in Catchment Management the benefit of 65 – to 1 at the moment. We have to stop thinking just about assets.

We need a three dimensional water management model.

If OFWAT were to do something differently what do you think it should do?

I would not agree if they define the environmental measures we needed to comply with, which they don't.

Companies have ignored or taken a very old fashioned approach we have got a business where catchment must be taken into consideration and we do that.

The ten million pounds spent up to 2015 adds only 65 pence to the bills of

customers (per year) – and this improves the catchment of the supply.

Previously we had the old approach, we would state to Ofwat, you need to give us this money for catchment development, if not we will go to Competition Commission. It is juvenile it is like your parent isn't giving you pocket money, we now need and have a more mature approach. We share in an attractive way with Ofwat, to say yes we want to be part of this and let us raise the money.

We know nothing about certain types of management, but the Rivers Trust do and so we use and fund them.

The Rivers Trust can focus on the management of the catchment and we can be their sponsors.

Catchment sensitive farming is running a year at a time. Catchment management has to run for 20 or 30 years for this to get a result.

There is a shortage of funding, but a long term sustainable catchment is more financially viable.

Landowners and companies using a trustee as an intermediary such as the Rivers Trust is the way forward.

You can educate farmers on:

Application rates

Weather implications

How weather has an impact on the business

Holistic Management

Simple, but effective models.

Why isn't everyone doing this? Some are!

In Wessex in over 80% of the boreholes they have appointed their catchment officers.

United Utilities is doing it to recover moorland from acid rain.

Now it is legislation free. It is run from the Trust to person to person. You generate a community as we are all mindful of our obligations to each other.

We should look after ourselves not the government looking after us.

We talked sufficiently with Ofwat for them to say yes we have problem solving technique, which is very powerful in these relationships.

In your opinion, will environmental aspects be discussed in the OFWAT review, which would endeavour make OFWAT have more holistic measures and goals?

A lot has to do with the regulators.

It looks at the world through a narrow filter and it fails to take a 360 view of the future.

If they stay only focused on the economic agenda it will miss what the government wants to see.

This is also with the environmental agency.

To Ofwat's credit it has started to do sustainability stuff.

For the moment it will increase sewers in South West Water.

Some things it is doing for political reasons, this is not a reasonable way to regulate an industry.

It must take a robust and pragmatic view of what and who it involves.

We have done a formal response for the Ofwat Review. We are trying to help them in a constructive way, redefine the remit and approach.

Or input punches above its weight.

Water should be capable to finance the functions. Arbitrarily low prices

should not be done.

Where we are and where we are going in the future is important and needs considering.

We need to see, what comes out of the things comes out.

It should focus on catchment management funding and structure.

Do you think OFWAT has done a good job at monitoring price?

Yes.

They have put the right pressures on poor companies to be better and they do reward.

At one time there was a 10% cut (in the prices companies could charge) and then in the next 5- 8 years that was quietly restored.

You can have what you like said god but you must pay for it, everything

comes with a price!

Do you think that it should widen its scope and monitor other aspects?

It needs to have more of a holistic view It must take some responsibility and recognition for forcing up the risk companies want to take.

It is not all sweetness and light by focusing on economics it is ignoring the other pressures.

It needs to be aware that different parts of the business have areas of funding which is safe and secure.

Ofwat's response to an increase in a company's spending (if rejected by Ofwat) is that it has failed to represent its case properly.

It is usually done through asset management people and engineering reporters working as risk specialists.

There were around ten reporters for the last review, engineering and

financial.

The problem is that the directors may not want to discuss things with the engineers about risk etc .

The Competition Commission is the only redress if we wish to dispute Ofwat's decision(s).

We have done two appeals to the Comission:

One for price setting in 1995 the other was when Wessex and Severn Trent tried to take us over in 1996.

Do you think OFWAT has enough powers and do you think they use the powers they have sufficiently?

They have plenty of powers but government does have to look at Ofwat's wider remit and role to look at company risk.

They need to look at how the companies are running their whole business.

Risk is different to efficiency. Some people confuse efficiency with price cutting.

What are your thoughts on the DWI and the EA?

If there are less people that means that it is not necessarily more efficient this comes as a concern that we need to run our assets more efficiently.

The DWI is small, efficient and focused and they our great allies.

The EA is beginning to get confused over its role between regulation and advice, subject to its restructuring there has been a loss of efficiency. They are not guardians because they are not there to look at the general health of the environment, they have become bureaucratic. To get anything decided is virtually impossible. They are not allowed to make localised decisions, when it gets to headquarters a non regional decision will be made.

The EA has bad systems and setups, it is a vast lumbering bureaucratic organization, anyone who is in there needs watch their job now.

Do you think that the DWI , EA and OFWAT should be combined or are they positively advancing as individual units?

The DWI monitors quality and should continue to stand alone, it secures quality for the directive and two for customers.

The DWI has a very singular and important purpose.

The EA role in the United States has got into role confusion, there are elements which are very advisory and should be taken out, the regulatory prosecution role they should retain that.

No, don't merge these organizations, they are better separate.

What new water technologies do you think will be introduced in the future?

New technological developments will be introduced for sure including a new process which is capable of reducing if not eliminating the pollution.

A bit of each firm is out there to try and get pollution down. This drive will bring new technology.

Ofwat uses the blunt instrument as an incentive to progress – the financial return.

Do you see any threats that the private sector may have to deal with?

Welsh Water overreached itself. It became too indebted Shareholders were dispensed with assets returned to the Secretary of State and now it is a customer owned mutual, the overseeing is appointed by the Welsh Government. This is a John Lewis / Waitrose style of model.

Some of the threats, if they over reach, or mismanage, then sanctions will be imposed.

Thames is now owned by an Australian bank, this has changed the mindset of the organisation.

The British Industry is very heavily geared and has borrowed massive amounts of money, what do you make of this and do you see this as a problem?

The owner of SWW (Pennon) has done a lot of loan restructuring to try and reduce this.

Upstream thinking and development (meaning pollution prevention and catchment management) will increase revenue.

One new regulation has come on after another which has successively prevented debt reduction. The amount of money owed is the biggest problem.

Ofwat had a limit for 65 % (gearing), then they raised it to 85%. The median rate of the various providers of gearing is about 80%.

Climate change and other forms of stress are happening and again there has to be spending to combat this.

What are your thoughts on metering?

We are 64% now (metered).

The quarterly the meter fee was £250 then it was reduced to £80, now it is free !

Meter costs are included in the bill.

Do you think that legislation should allow companies to shut off people's water if they do not pay?

No.

Neither is there a case for trickle meters. When the water was disconnected people would use a bucket and not a toilet. The public health aspects must be considered.

Are there any laws or restrictions that you would like to be passed or reversed that would impact your business?

No

We have a good business environment. It is good that Defra are having good discussions at present.

Engagement is much better than that non engagement.

Looking into the future what do you think will be the most important area in your business and is that different to the present?

Climate change is number one.

Climate Change is so special for the south west where 65% are at or around sea level. 65% are at high risk of property floods.

Badly behaved water and badly behaved sea water in the future will be the cause of a lot of problems.

The other thing that goes with that is the flooding of sewers.

We need to separate the sewage from the rain water.

We need to minimise the water through the sewage treatment, but we don't have an ideal world, the cost of separation is this is great.

That is an ambition not a universal prescription.

Do you think water is a good investment and if so why?

Yes. It is a constant Cash Cow. It provides relatively steady incomes but nothing spectacular.

Pennon Group is generating twice as much as it consumes

The rising star is SWW we need to make it more robust but at present things are very interesting.

We provide 4% dividends above inflation it does well, so far so good !

Our next big plan is waste to energy.

Appendix 1

Interview with

Mark Holloway

Head of Markets

of

Thames Water Utilities Limited

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on

25 November, 2010 – In Person

(This interview has been abbreviated to include the main points.)

Please note that this interview was more conversational and did not follow set questions, at the request of the interviewee.

Interviewee Information

Thames Water Utilities is the provider of water and sewage services to London and the surrounding vicinity. It services 8.7 million customers and owns Europe's largest wastewater treatment works.

This interview has noted the main points of a free flowing discussion

There are three markets in England and Wales;

The customers

The larger consumers

The abstraction market.

The first two are regulated by Ofwat and the third is regulated by the Environment Agency, (EA).

The way that the system works is that anyone that wants to use a large amount of water from a river or a bore hole has to get an abstraction licence. This gives you the right to extract and it is those licences that you can buy and sell. In addition to that water companies buy and sell water from one another, this can also be traded.

The government is planning to produce a water white paper probably doing the reviewing the water sector.[924]

[924] (http://www.official-documents.gov.uk/document/cm82/8230/8230.pdf)

The government has put out a consultation on the environment with a view to bring out a white paper, that only touched on water to a small extent the larger document on the water industry is due out in several years – that will have a number of items in it, they are looking at water efficiency and resources.

The Cave Review in addition is something that may interest you.[925]

The Walker Review discusses charging for water to consumers and metering that may also be helpful.[926]

Water efficiency and resource there may be in the White Paper

On the Cave Review, Defra have already consulted on several issues so that the next step will be putting those conclusions in the water white paper and progressing to action.

White Paper will include Walker, Cave and various other documents.

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[925] The Cave Review was an independent review on Competition and Innovation in the Water Markets. This can be viewed from the following link : http://archive.defra.gov.uk/environment/quality/water/industry/cavereview/documents/cavereview-finalreport.pdf

[926] http://www.defra.gov.uk/publications/files/pb13336-walker-water-review-091205.pdf

Water efficiency has a variety of meanings from individual water use to water use from an industry perspective or agriculture or power generation. –

Quality from a use perspective is a cost factor. So if you thin about the worst kind of water you can get is sea water. You then need to treat it if you want to drink it. That is the most costly water although there is plenty of it, the cleanest water is via pure groundwater source.

The industry is currently discussing and considering determining an economic value, for water as a commodity, this will be very interesting.

There are discussions about the need to establish price through scarcity and quality. This is also interesting as in commodity terms it is much more available in Scotland.

The administrative price for an extraction licences vary across the country. It is twice the price in Northumberland[927] as compared to the price in the South East of England.

[927] North East segment of England which is contiguous with Scotland.

Martin Cave is an economic professor.

What cave is advocating is more separation of the supply chain and the introduction of retail competition. Also competition for the competition of wholesale services, provision of water resources, water treatment and disposal etc

The Walker Review was looking at charging and the nature of cross subsidies in the sector and the importance of metering. Where you meter in a domestic side it can disadvantage large families and that has a consequence if they are poor etc

So there is going to be a consultation on Walker prior to the White Paper

Ofwat is also under review. A paper will be published by David Gray.[928]

David Gray has been heavily involved with the energy sector.

[928] http://www.defra.gov.uk/publications/files/ofwat-review-2011.pdf

David has just concluded collecting evidence and he is now writing his report.

One area that you should focus on is the past investment. There has been roughly 85-90 Billion pounds of investment since privatization and that is important.

Water UK seek to establish views on how the water sector ought to evolve, an interesting organisation for you look at.[929]

If there is legislation required after the White Paper that will come forward in 2012/13. There may be further legislation on efficiency and other matters.

In a world of uncertainty private institutions are more able to change and innovate than public institutions.

So going back to privatisation there were a lot of regional organizations and

[929] http://www.water.org.uk/

privatization aggregated those and then they were sold off.

One of the things that Caves looked at, is the potential benefits of water companies. He suggested there should be a change in the law, to aggregate further.

At the moment under the Enterprise Act[930] we are part of the special mergers regime, so any merger over £10 million turnover in aggregate involves Ofwat and Ofwat historically were opposed to any mergers.

From a privatization perspective there have been many efficiency gains and at the same time the industry has introduced major investment to improve the environment and the security of supply.

The three key factors are :

A sustainable environment

Ensuring security of supply

Third element is efficiency to which you deliver that water.

[930] The Enterprise Act 2002:
(http://www.legislation.gov.uk/ukpga/2002/40/contents)

My premise would be that private companies are better able to deliver these than publicly run companies.

What about the price:

Price is about efficiency so where you have private companies you have an issue with such a commodity as water that is why Stephen Littlechild's X index is used. The economic regulator sets how much you can recover – if you can deliver for less – you can keep the profit for that period – it works.

In principle you are always driving to ever increasing levels of efficiency so your customers are confident that the service could not have been provided at a lower price.

This was first introduced when BT (British Telecom) was privatised and then it was copied in a large number of other privatisations.

The four major economists that have had an impact are :

Martin Cave, George Yarrow, Stephen Littlechild and Dieter Helm

In relation to why the water sector privatized, this was really about the availability of State cash. Thatcherism was a belief that private was better

than Sate and that belief was brought to water provision.

Also utilities need infrastructure investment.

There was also the political reason of reducing the power of the unions.

One of the issues with public expenditure is when the government are thinking of how to enhance growth and one of the planks of that in this time of austerity is to increase capital investment, not through government expenditure, and so they are thinking about the private sector.

One of the major planks of private utilities that are regulated is through a concept called Regulatory Asset Value (RAV) – this is a measure of the capital employed in the network provision.

Basically how RAV works is one establishes an asset value of companies. Generally how that has been done is looking at the market capitalisation at a period after it was floated on the stock exchange and in the water sector that was 200 days after flotation and that established the asset value and the regulator uses that to provide a key plank to establish how much companies

can charge the consumers for the service provided and the way you do that is multiplying the RAV by weighted average cost of capital.

So for example one looks at what companies can borrow money at and at the cost of equity and you put them together, equity cost and debt cost and you get a weighted average cost of capital.

So you multiply the cost of capital by regulatory asset value that gives you a return for the assets in the company, for the five year period, a number of other factors are also included.

Private individuals could invest and get a regulated rate of return, drive efficiency and investors drive out inefficiencies, the business needs to be run efficiently.

Privatisation is efficient as there is an incentive on the private investor to drive out inefficiency in a regulated environment which protects the consumer.

At the highest level Ofwat do a very good job. Their duties placed on them by the law work well to provide a stable environment for the sector to operate within and they protect consumers from the excesses of an unregulated monopoly.

There is always opportunity from enhancement.

OFWAT are fit for purpose and the most important thing from an investor point of view is stability and transparency that is what you get in our water sector.

If you look at Moody's the credit rating agency the water sector from a regulatory point of view is AAA, the top rating.

Because of the stability of the regulatory environment and the ongoing nature of the investment there is a lot of debt and heavy gearing in the industry, but it is stable as a sector with a stable economic environment.

It can afford to have high gearing because the nature of the business it is in.

The revenue stream is assured, it is a regional monopoly.

An equity investor is always looking for as high a return as possible, but they also look for stability.

In the UK the industry is quite heavily owned by infrastructure firms.

It is important to understand that not all equity investors are the same, look at their motives and what they want from an company.

I would argue that a water investor should not be looking for aggressive growth but a reasonable rate of return that reflects low risk.

From the point of view of stability it is a two edge sword If they are looking at growth and investors are looking at countries that are not developed there is a lot of growth but then you have political and regulatory uncertainty, there is not gearing but, you would expect a greater level of return as a result of the risk.

At the moment water and all the regulated utilities have recently had a focus

because part of their regulatory regime allows to recover rpi so where as a lot of other sectors don't have that protection and cash investments and property investments look unattractive, one way to protect yourself against inflation is to invest in infrastructure, because of this it is well understood, from a water and telecoms perspective there is a lot of interest because inflation has been going up, how long this will last is another question.

From a growth point of view I am a great believer for companies to stick to the knitting and allow equity investors to diversify, I am not advocating moving into other sectors and other countries.

GWE sold Thames in 2006 to Kemball which is a consortium of funds, pension funds and infrastructure funds. The major share holder is Macquarie It is a large Australian investment bank, they have a large number of infrastructure and pension funds and there are numerous other investors. And they looked to the UK for good reasons.

Defra (Department for environment, food and rural affairs) is the government department, from an economic perspective Ofwat is the

regulator. Ofwat is independent of government, when governments get involved they tend to push things for a political reason for short term gains but if you talk about infrastructure projects, you need a lot of political stability, stable regulation is vital for keeping prices low if there is instability there is more risk and money to build projects becomes more expensive.

DWI (Drinking Water Inspectorate) is the drinking water agency that covers quality

EA (Environment Agency) is the other agency which covers environmental issues.

All are under Defra

The Environment Agency through the 2003 Act, requires a water resource management plan from providers. That water resource management plan looks across other water companies and looks at where the water will come from.

But it is only a plan, it gets agreed by the Secretary of State but it is not

mandatory so talking about looking at the catchment areas, where water is scarce, or not scarce that plan looks at that area and proposes spending.

OFWAT decides how much can be invested at any time in catchment areas by the companies.

One of the issues is how do you reconcile what is in the water resource management plan and the five year price cycle.

The five year price cycle may change in the future.

Ofwat has the power to change the cycle.

What would be helpful if there was more clarity of roles, Ofwat has a sustainability duty it would be helpful to understand the EA roles in relation to sustainability.

The EA has a number of roles to protect the environment and provide sufficient water for public use. It also has a number of administration roles –

abstraction roles.

Clarity over roles and responsibilities rather than a transformational change would be good.

In relation to Ofwat, we did customer research that indicated that customers that customers had an appetite for investment, but Ofwat was quite conservative with what it allowed them to invest in over that period.

With the regime as is, we can challenge Ofwat decisions through the competition commission.

We would have liked to invest more in the area of leakage, for example, but on balance we find Ofwat's decisions reasonable.

We spend our money on capital expenditure, how much we can do in the period is confirmed with Ofwat.

Capital spending is influenced also by things like legislation; environmental

legislation, the Water Framework Directive. This is a big driver of cost. London is very expensive to serve from an operations perspective this is taken into account.

Operational and Capital expenditure are separated.

Appendix 1

Interview with

David Hackett

European Affairs Manager

of

OFWAT (Water Services Regulation Authority)

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on

26, November, 2010 – In Person

(This interview has been abbreviated to include the main points.)

Interviewee Information

OFWAT is the economic regulator of the water and sewage industry in England and Wales. It has extensive powers in relation including; price capping, regulation and administration of the water and sewage industry.

In your opinion why was water privatised?

There was a neglected infrastructure with limited investment, an increase in the leakage, lots of pipes were over 100 year olds, there was a view that the public authorities were not efficient and there was a view at the time that tax payers did not want to spend any more.

Governmental low taxation ideology was installed. There was a trend during that administration.

In the water industry before privatisation there was little incentive to improve the performance.

Then there was a lot of concern with environmental legislation.

Britain was the dirty man of Europe. This was shown by a lack of fish species in the rivers and dirty beaches, somebody had to pay for it.

Privatization took out the political interference, an issue in other parts of the world.

Was privatisation either needed or did it benefit the industry and why?
It benefited the industry because the assets were sold at a rock bottom price, there was a realization that the efficiencies that could be made were huge, the profits that were made were a lot higher than expected.

Our role as a regulator is not to ensure they make these big profits but our concern is not for the companies but for the sector as whole.

There were other models, the Scottish model could have been an option.

Scotland retained the ownership the conservatives did not have a political base in Scotland it would have been difficult to impose it there.

Also it was separate between England and Wales, Scotland was more independent. Scotland had and has separate legal and education system. The Water Industry Act covers England and Wales it would have been a different Act in Scotland, the same with Northern Ireland.

Do you think the industry changed?

Sometimes there still persists a public sector ethos.

Why do you think that a private company can adequately balance the provision of service to the customer and the optimizing of profits?

We set the prices the maximum. We allow the profit. If we make efficiency savings then they are allowed to retain some of that profit. We build it so that their incentives are in line with the customers. The customers have to get the best service and best quality of water.

The quality of the water has very much improved if you look at the environmental regulations that have come from Europe. The UK has gone up significantly, for example there are more fish in the Thames – this is down to the investment, post privatisation.

There are chemical and biological measures. We have gone up to 75% - we were below 20% on this is index.

Many think that the private sector should not be involved in the provision of water, what would you say to those individuals?

I would say that it is really a question of who pays and there are only some options. Through England and Wales the money comes through the bill, or investment through the markets, if not that then it has to come through the taxpayers. Who is best placed is it markets and customers or taxpayers to make decisions? There have been lots of benefits with this system.It is more transparent, it is more responsive. When you rely on taxpayer money the money is often hidden. When you come to addressing bigger issues, it is much better to have the openness around what the costs are who is paying and where from.

Why do you believe that privatisation in England and Wales has succeeded?

It is to do with the way that it is regulated. Ofwat has been given strong

powers and we have been given quite a lot of duties around the accountability of the providers.

The fact Ofwat can operate independently is very important. In other countries that full independence would be difficult to achieve. The UK has a mature legal and regulatory system, here this system works very well.

Why is Ofwat essential?

It balances the competing interests, on one side the companies that want to make as much as possible, but on the other hand we have the consumer and the challenge of the environment. We are the ring master of all of this.

Why has OFWAT been a success?

OFWAT has been very well run in its 20 year history, the organization has done a good job at running this.

If Ofwat were to do something differently what do you think it should do?

We are monitoring the companies all the time however we can miss issues. Even though we get data we may not look critically enough where

companies have not been performing. Sometimes we get information through whistleblowers and not through monitoring. We need to look at how cumbersome the organization has become. We need to be fleet of foot. We need to be more random, not so process heavy and possibly challenge the company to take risks on themselves.

OFWAT is currently under review, what do you think this review will conclude?

It is difficult to say. We have submitted information which is on the webpage. Initial indications suggest that we may be given a wider social and environmental duty.

The legal framework

The Consumer Council for Water – have a responsibility to protect consumers. In the context of that it may be difficult to conclude that Ofwat should be enlarged – it may suggest we should do more with the same resources.

Some have said that river catchment management has suffered and indeed that environmental measures have been restricted by OFWAT - do you have any information here?

There is often a charge about us stopping investment. We will not stop a benefit if it outweighs a cost. It is easy for people to say Ofwat is stopping us, this is not the case, if so then the business case has not been made, the cost benefits are not right.

We absolutely consider environmental issues, but through the prism of cost. We do not have a duty to do the job of the environment agency.

If there is mandatory European legislation what we look at is the most cost effective way of achieving that legislation. We will not agree with environmental purists. We would not fund, we have to balance against what customers have to pay.

Do you think OFWAT has done a good job at monitoring price?

Yes

Do you think OFWAT has sufficient powers or needs more powers?

I think there would be people who would say yes around the monitoring and enforcement. Also we need the clarity of powers, sometimes the Defra guidelines conflict with the legislation.

The British Industry is very heavily reliant on OFWAT, how do you think that this has an impact on investment?

We do look at investment and the difficulties later on in the five year price review period. There is a general feeling that a price review may be changed, not the frequency of review but the way in which the review is assessed.

In addition retail and wholesale could potentially be separated.

What are your thoughts on metering?

Ultimately the Secretary of State would decide on metering. We are broadly in favour of it as it encourages a sensible use of water.

Looking into the future what do you think will be the most important area for OFWAT and is that different to the present?

Sustainability, we are starting to look away from how to why and some of the challenge is climate change. Flooding burdens in drainage systems. In addition, the rise in single households, the increased ageing infrastructure and also the growing population in London and the South East of England.

Price and affordability, this is something that we are looking at, how we can deal with issues of cross subsidy, some bills are more expensive than others South West is about £600 etc – un metered and it also has the lowest incomes.

This is an issue for government. We can explain why South West is so high, coastline and beaches and a legacy of mining, the water needs purified, it has a long coast line so there is a lot of bathing waters etc.

Appendix 1

Interview with

Mr Archie Ruggles-Brise

Director (South East)
of

Association of Rivers Trusts

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on

29 November, 2010 – In Person

(This interview has been abbreviated to include the main points of interest.)

Interviewee Information

The Association of Rivers Trusts is an organisation, which comprises various river trusts across England and Wales and is concerned with the maintenance and preservation of the rivers and surrounding environment.

Introductory discussion

We have only recently engaged with the water industry. Previously the water companies have had no motive to aid catchment management. When water companies improve the catchment it will improve profit they are staring to realize this now.

Martin Ross (Of Pennon) is an example of where a company reaches out to assist catchments, other companies are not like this.

In the last price review in 2004 Ofwat didn't push catchment management, but in 2009, they did and the investment proposed by companies was generally accepted by Ofwat.

Ofwat are responding to the last government's pressure to encourage private industry to help with catchment management.

This is linked to the fact that the Water Framework Directive has been enacted.

Why do you think the Rivers Trusts are essential?

There are two reasons why we exist: Firstly the Environment Agency has been doing less and since it was formed it has done less. Now the public have said that they want more to happen. More recently the Rivers Trust has grown and the second reason is that the Water Framework Directive.

The Rivers Trust has only been formed in the past 15 years. In terms of becoming established it has been in the last five years where there has been an exponential growth. Now there are 37 rivers trusts.

You don't have to be a trust in name, you basically just need to share the objectives and have a practical element towards your organisation.

Who is responsible from rubbish collection in and around the rivers and in the river beds?

If there is rubbish in the water and causing a flooding risk the EA may do something about it. If the rubbish is on the bank – on the foreshore they will not. This is a statutory gap in the legislation!

For example with fly tipping the EA has no obligation to remove the rubbish it is the landowner that has the duty to dispose of waste on their land. That

obviously introduces an issue. It does mean that this issue can be ignored by government to a degree.

In the Rivers Trust in each catchment, the priorities are set by those in the trust. It can be everything and anything. We say you want to consider as many interests as you can in terms of defining what they do that is up to them. They facilitate the process and the trust facilitates the concepts for the catchment. What is always lacking is a central management process, nationally we help them do that but, you cant dictate what voluntary people do.

The EA is a big national regulator. It is difficult to get local buy in to national policies you will always get questions.

Relu gives another string to set the project. The researchers contact the land owners and the farmers.

Should the Rivers Trusts be incorporated into the water system and act as intermediaries between water companies and land owners?
This should remain independent. It is fundamental to being able to achieve things.

Each Rivers Trust currently gets money from a variety of different organizations including; the lottery, local governent, national bodies right up to DEFRA and then the EU it is good to get these resources from a variety of places.

Should the Rivers Trust be funded directly by government?

Government funding would be good, core government funding but we don't want to be a beholden to that.

Do you think the Rivers Trusts fills an essential gap in water and catchment management?

Absolutely, it is the central facilitation and delivery of catchment management. It varies in each instance from rubbish collection to various different forms of management. For example we pinpoint invasive non native species such as himilayan balsum. It is pretty but it is invasive it overcrowds and as an annual plant it leaves bare banks. The only way to tackle it was on a catchment scale. Start at the top and go down. The same

for various different forms of wildlife, that are not native and are detrimental to the environment and the catchment.

Do you believe OFWAT is essential?

The way in which ofwat is setting its pricing is changing to include catchment management and to our benefit. There have been around 100 catchment projects with the water companies since 2009.

Hopefully this gets the water companies on board in relation to catchment management.

Once you get them to consider that catchment management may improve their business then progress can be made.

The EA should be monitoring the catchments and they are just not doing it they monitor particular elements for particular reasons the habitat, water, flooding but not the catchment as a whole.

The DWI are in charge of water quality and standards but very little of what they monitor is on a catchment scale.

How should private water companies interact more and support future Rivers Trusts Projects?

There is a benefit to them as the water quality will improve. The best model of how that relationship could be developed is through the investment process, reducing their treatment costs as the water is cleaner, this saving will encourage corporate social responsibility.

South West Water has made available ten million pounds for catchment development, two or three has been given to the Rivers Trusts, and that is sanctioned by Ofwat and levied on customers bills. That is the only direct relationship like that in the country. There are similar projects – united utilities had a project with the RSPB, they both own the catchment though.

There are lots of ways to help a catchment from the prevention of sediment falling into the water supply, to introducing buffer strips to prevent sloping fields, to providing guidance to farmers.

Are there any laws or restrictions that you would like to be passed or reversed that would impact your organisation?

There is too much legislation.

We are only now starting to see the Water Framework directive being implemented in catchments.

Looking into the future what do you think will be the most important area for the Rivers Trust and is that different to the present?

I don't think there is a lot of different things that are going to change that much in terms of the practical intervention.

We as an organisation have to be more commercial.

We can operate in a small way with small amount of money – but there is the potential to go big.

Appendix 1

Interview with

Martin Furness

Principal Scientist

of

OFWAT (Water Services Regulation Authority)

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on

30, November, 2010 – In Person

(This interview has not been included as requested by the interviewee.)

Interviewee Information

OFWAT is the economic regulator of the water and sewage industry in England and Wales. It has extensive powers in relation to and including; price capping, regulation and administration of the water and sewage industry.

Appendix 1

Interview with

James Bream

Regulation and Business Manager

of

Business Stream

Registered in Scotland No. SC294924

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Telephone (44) (0) 1903272644

on

1 December 2010 – Via Letter

28 December 2010 – In Person

(This interview has been abbreviated to include the main points.)

Interviewee Information

Business Stream is Limited Company wholly owned by Scottish Water. It provides non domestic customers, of which there are over 110,000, with water and sewage services. It holds over 95% of the market share.

Why do you think that a competitive (non domestic) water market is better for the country?

This is a very broad question. Let's assume for a moment that the competitive water market works. Clearly this puts Scotland out in the world as a thought leader and innovator. There are many benefits associated with this which are too vast for me to discuss.

In terms of the country what I can respond to is that it can generate a lot of benefits for customers, the market and the public in its widest sense. It is worth noting of course that we only have non-domestic competition at this time. Some of the benefits are as follows:

Customer Savings

As at October 2010 over 40% of customers are receiving discounts from default charges. We expect to have 50% off default charges by April 2011. Default tariffs are the maximum retail charges which a licensed retail provider can charge. These maximum charges are what would have been charged if there was not a competitive market.

Customers have saved £10 Million consumption costs through water efficiency projects.

Over 70% of public sector organisations now receive a single electronic bill (rather than paper bills) and over 15% of our total customer base has signed up for e-billing in the last 12 months, saving them time and money.

Increased Choice

Customers now have access to over 60 added value services, helping them to save time, save money, reduce risk and meet environmental targets.

Customers can now access innovative new propositions, including online benchmarking, smart metering and water efficiency services.

Access to capital investment for efficiency projects under risk reward financing models. This is particularly important as we go through some severe public sector cuts particularly capital budgets.

Environmental Benefits

We've saved customers over 5,000 tonnes of CO2, the equivalent of taking over 1,400 cars off the road.

We've issued businesses over 15,000 free water efficiency packs.

Better Service

Satisfaction has increased from 72% to 81%.

There are more very satisfied customers from 24% to 29%

Benefits to the Market

We have reduced our inherited cost base by 22% in just over 3 years.

In November 2006, Business Stream was allocated 90 Million of funding debt for set up. Through creating a customer centric brand we have been able to to repay a significant amount of this sum, reducing the total outstanding debt to £44.5 Million.

We have driven the wholesaler, Scottish Water, to improve their performance by providing increased external challenge. This benefits the country as Scottish Water is publicly owned.

I also think that the competitive market reduces the regulatory burden. It is very valid to claim this benefit as markets can help send the right signals and don't have the same level of information asymmetry a regulator faces.

Do you believe that the private sector will grow nationally and internationally with the provision of 'water' services? If so why and if not why not?

I assume you are asking if I believe othe countries will introduce retail water competition. As an economist my personal opinion would be I hope so but my honest answer is I don't know.

There are moves a foot in England to consider implementing retail competition. However it looks like Wales does not want to be part of this. If it does not happen it will be because customers demand this, and the cost

benefit analyses undertaken to date are accepted by ministers. This is a question we could discuss more in person.

As you now have been granted permission to operate in England and Wales how do you see your business changing?

You are correct we do hold a Water Supply License for England and Wales. However the regulatory arrangements and market structure make actually doing anything with this license difficult. Without going into details, effective retail competition can't be achieved within current market structures.

Effectively if vertically integrated companies are not separated and pricing methods for wholsale/retail pricing are not revised we will not see a big change in our business because of England and Wales.

We will continue to evolve and possibly provide non-licensed services in England and Wales. However, evolution would not be driven by our license under existing market arrangements.

Price is obviously one of the most important factors in the supply of such an essential resource. How do you determine the fairness of your price?

The principles of pricing are set by the Scottish Government. For example, one of the broad principles is to have stable prices. I alluded to 'default tariffs'. Each year all licensed providers are set a maximum price and a minimum service that they can provide. This provides a safety barrier for customers. We use this as our minimum offering. We offer all customers a better service at a lower price than the default levels. It is of course partly the choice of the customer what they want to take!

How do you see the water industry changing in the future?

This is hard to second guess. I can certainly see immediate changes in the Scottish retail market. This is likely to include, in the short term, changes which will give Licensed Providers more accountability and control over customers facing issues. I would expect Licensed Providers will be given

powers to change and install meters, undertake new connections and undertake trade effluent sampling.

In terms of England and Wales a white paper is being published in June 2011. this will set out our expectations for the broad policy direction. I would like to think this will include measures to introduce real retail competition possibly leading to other upstream competition.

In terms of the regulatory framework I would expect to see the nature of regulation changing. There is a real will from regulators to reduce the regulatory burden. I see a move towards more risk based regulation. I imagine this to mean less formal regulatory requests and reporting, but greater expectations that companies will themselves have to adopt suitable governance and risk structures.

What sort of technologies are you interested in and why?

At this time we are very interested in Automated Meter Reading technology to manage customers' consumption and risk. This can also potentially reduce our operating costs.

In general we are always seeking innovative solutions to meet customer's needs. This already includes various leak detection technologies, boreholes and standalone waste treatment plants. However, it is probably important to say we are not necessarily focused on physical technology.

Much of our focus for our broad customer base is involved in generating innovative billing solutions including online account management and other customer service options.

This is a general answer and of course let me know if you want specifics.

How do you feel towards the legislation, which currently governs your business? Are there any restrictions which impede your business?

In terms of broad areas I'd split the question into two areas:

Legislation – i.e. the Law

Regulation –i.e. the rules of the market

In terms of legislation and regulation there are some very specific areas where we find difficulties in recovering our costs from some customers who choose not to pay. What I would say is that on the whole where a regulatory reason causes issues there are opportunities to influence or change this.

We have a market 'technical panel' where participants can suggest changes which are discussed and voted on. This is not always fruitful but is an option. Where legislative issues cause us pain there is no clear or easy way to address this. As you probably know changing legal statute takes some time and is often not realistic. In that sense it is important that the rules of the game take cognisance of legal weaknesses. This means that regulators and their agents need to listen to the concerns of market participants.

What are your thoughts on the role and performance of OFWAT?

To date our dealings with OFWAT has been limited. We applied for our water supply license and found them helpful and responsive. We also attended industry working groups seeking to revise the competitive market in England and Wales. These were held in a controlled but open manner.

On the whole I have personally found OFWAT staff good to work with. I'll be interested to see whether they deliver their commitments on expanding competition.

Can you think of any potential threats the water industry may face?

From our point of view we hope that the market continues to evolve so it encourages competition that benefits customers.

Appendix 1

Interview with

David Hackett

European Affairs Manager

of

OFWAT (Water Services Regulation Authority)

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Email: David.Hackett@ofwat.gsi.gov.uk

on

26, November, 2010 – In Person

(This interview has been abbreviated to include the main points.)

Interviewee Information

OFWAT is the economic regulator of the water and sewage industry in England and Wales. It has extensive powers in relation including; price capping, regulation and administration of the water and sewage industry.

In your opinion why was water privatised?

There was a neglected infrastructure with limited investment, an increase in the leakage, lots of pipes were over 100 year olds, there was a view that the public authorities were not efficient and there was a view at the time that tax payers did not want to spend any more.

Governmental low taxation ideology was installed. There was a trend during that administration.

In the water industry before privatisation there was little incentive to improve the performance.

Then there was a lot of concern with environmental legislation.

Britain was the dirty man of Europe. This was shown by a lack of fish species in the rivers and dirty beaches, somebody had to pay for it.

Privatization took out the political interference, an issue in other parts of the

world.

Was privatisation either needed or did it benefit the industry and why?
It benefited the industry because the assets were sold at a rock bottom price, there was a realization that the efficiencies that could be made were huge, the profits that were made were a lot higher than expected.

Our role as a regulator is not to ensure they make these big profits but our concern is not for the companies but for the sector as whole.

There were other models, the Scottish model could have been an option.

Scotland retained the ownership the conservatives did not have a political base in Scotland it would have been difficult to impose it there.

Also it was separate between England and Wales, Scotland was more independent. Scotland had and has separate legal and education system. The Water Industry Act covers England and Wales it would have been a different Act in Scotland, the same with Northern Ireland.

Do you think the industry changed?

Sometimes there still persists a public sector ethos.

Why do you think that a private company can adequately balance the provision of service to the customer and the optimizing of profits?

We set the prices the maximum. We allow the profit. If we make efficiency savings then they are allowed to retain some of that profit. We build it so that their incentives are in line with the customers. The customers have to get the best service and best quality of water.

The quality of the water has very much improved if you look at the environmental regulations that have come from Europe. The UK has gone up significantly, for example there are more fish in the Thames – this is down to the investment, post privatisation.

There are chemical and biological measures. We have gone up to 75% - we were below 20% on this is index.

Many think that the private sector should not be involved in the provision of water, what would you say to those individuals?

I would say that it is really a question of who pays and there are only some options. Through England and Wales the money comes through the bill, or investment through the markets, if not that then it has to come through the taxpayers. Who is best placed is it markets and customers or taxpayers to make decisions? There have been lots of benefits with this system.It is more transparent, it is more responsive. When you rely on taxpayer money the money is often hidden. When you come to addressing bigger issues, it is much better to have the openness around what the costs are who is paying and where from.

Why do you believe that privatisation in England and Wales has succeeded? It is to do with the way that it is regulated. Ofwat has been given strong powers and we have been given quite a lot of duties around the accountability of the providers.

The fact Ofwat can operate independently is very important. In other countries that full independence would be difficult to achieve. The UK has a mature legal and regulatory system, here this system works very well.

Why is Ofwat essential?

It balances the competing interests, on one side the companies that want to make as much as possible, but on the other hand we have the consumer and the challenge of the environment. We are the ring master of all of this.

Why has OFWAT been a success?

OFWAT has been very well run in its 20 year history, the organization has done a good job at running this.

If Ofwat were to do something differently what do you think it should do?

We are monitoring the companies all the time however we can miss issues.

Even though we get data we may not look critically enough where companies have not been performing. Sometimes we get information through whistleblowers and not through monitoring. We need to look at how cumbersome the organization has become. We need to be fleet of foot. We need to be more random, not so process heavy and possibly challenge the company to take risks on themselves.

OFWAT is currently under review, what do you think this review will conclude?

It is difficult to say. We have submitted information which is on the webpage. Initial indications suggest that we may be given a wider social and environmental duty.

The legal framework

The Consumer Council for Water – have a responsibility to protect consumers. In the context of that it may be difficult to conclude that Ofwat should be enlarged – it may suggest we should do more with the same resources.

Some have said that river catchment management has suffered and indeed that environmental measures have been restricted by OFWAT - do you have any information here?

There is often a charge about us stopping investment. We will not stop a benefit if it outweighs a cost. It is easy for people to say Ofwat is stopping us, this is not the case, if so then the business case has not been made, the cost benefits are not right.

We absolutely consider environmental issues, but through the prism of cost. We do not have a duty to do the job of the environment agency.

If there is mandatory European legislation what we look at is the most cost effective way of achieving that legislation. We will not agree with environmental purists. We would not fund, we have to balance against what customers have to pay.

Do you think OFWAT has done a good job at monitoring price?

Yes

Do you think OFWAT has sufficient powers or needs more powers?

I think there would be people who would say yes around the monitoring and enforcement. Also we need the clarity of powers, sometimes the Defra guidelines conflict with the legislation.

The British Industry is very heavily reliant on OFWAT, how do you think that this has an impact on investment?

We do look at investment and the difficulties later on in the five year price review period. There is a general feeling that a price review may be changed, not the frequency of review but the way in which the review is assessed.

In addition retail and wholesale could potentially be separated.

What are your thoughts on metering?

Ultimately the Secretary of State would decide on metering. We are broadly in favour of it as it encourages a sensible use of water.

Looking into the future what do you think will be the most important area for OFWAT and is that different to the present?

Sustainability, we are starting to look away from how to why and some of the challenge is climate change. Flooding burdens in drainage systems. In addition, the rise in single households, the increased ageing infrastructure and also the growing population in London and the South East of England.

Price and affordability, this is something that we are looking at, how we can deal with issues of cross subsidy, some bills are more expensive than others South West is about £600 etc – un metered and it also has the lowest incomes.

This is an issue for government. We can explain why South West is so high, coastline and beaches and a legacy of mining, the water needs purified, it has a long coast line so there is a lot of bathing waters etc.

Appendix 1

Interview with

Richard Ackroyd

of

Scottish Water Statutory Corporation

(100% Government Ownership)

Registered Office: Scottish Water, Castle House, 6 Castle Drive,

Carnegie Campus, Dunfermline,

KY11 8GG

Joan Murray (PA) Telephone (44) (0) 1383848475

Email (richard.ackroyd@scottishwater.co.uk)

on

9 March, 2012 – In Person at Scottish Water

(This interview has been abbreviated to include the main points.)

Interviewee Information

Scottish Water is the National water and sewage treatment business serving almost all of the domestic needs in Scotland. It is owned wholly, by the Government of Scotland, as a Statutory Corporation.

Scottish Water currently provides a very high quality of water at a relatively low price. In addition to this what do you consider Scottish Water's greatest achievements?

The way I sum it up is that it was a coming together of underperforming (Scottish) water authorities, into one, Scottish Water. It was created in the mid 90s, water previously being run by the regional (governmental) councils, which were abolished in the mid 90s. Over that period it has shifted, clearly now performing as well as the providers in England and Wales, it having come from a long, long way behind. Every measure has improved from efficiency to the environment.

From your experience in Yorkshire Water and Water UK has privatisation been a positive thing for England and Wales?

The short answer is yes.

There are multiple models and privatisation can cover a variety of models. The English model is unique in that it is privatisation with companies being

floated in the stock exchange. In the US most companies are not floated on the stock exchange. So there are a variety of models that you can have. The key element of the English system is that you have got private capital. You have private capital, which would otherwise not be available. Secondly the regulatory system has been absolutely vital, because what it is doing is imposing pressure, incentives and penalties for the sector. These are lacking naturally because it is a form of monopoly, the private pressures are not present, you can have a very well intentioned management, but even the best intentions can get fat and lazy. Equally you can have a self interested management. The regulatory management has been very important, it has to be underpinned by checks and balances, the legal function in essence. There is a statutory obligation of Ofwat. Ofwat has a duty to finance their functions. The investors (of the providers) earn a reasonable rate of return in their investments, this is a vital principal.

In England and Wales this system on the whole and its regulation has been positive. Almost £100 billion has now been invested, the environment has improved and quality is vastly better.

Do you think there were any non governmental factors which encouraged the Thatcher government to privatise the water systems (e.g. pressure form private corporations) or do you think this was one in a series of privatisations driven by the beliefs of the government?

I joined the industry one year before privatisation, at the age of 30. I was head of the legal department. The two principal drivers; one was the Thatcherite view philosophically and two, the pragmatic view that a huge wave of investment was needed. This was the principal driver, attract investment from the equity and debt markets. There was an ideological drive but the big driver was the need to get capital investment.

In your opinion why was Scottish Water not Privatised?

If you go back, water was provided by the Scottish councils. In England and Wales there were already water provision entities.

In addition Scotland was a more socialist country at that point. Political factors were more important against privatisation. This was shown in the Strathclyde Referendum. So privatisation did not happen and since then devolution happened and it has become a devolved responsibility.

I believe the debate should be what should be the best way for Scottish Water to be financed.

Should it be financed on the debt market by the Scottish Government – then there would be the possibility to refinance existing debt or sell more debt this is currently impossible. Debt finance is something that should be considered in the future.

In what ways have you incorporated the methodology of private companies into Scottish Water?

The core principal is that Scottish Water is a business not a public authority. We try to replicate the private companies, this is very important to out philosophy and methodology.

What do you think that English Corporations could learn from Scottish Water?

For many years we have been in catch up from the English system. I don't want to preach to other providers.

We are however more advanced in the fact that we have retail competition for non household customers. This is not currently possible elsewhere due to lack of legislation. Others may possibly learn from the Scottish experience.

There should be an inter regional market where authorities can sell their water in a way which would allow a non domestic customer to have an option to buy from various providers.

Currently Business Stream has the majority of the Scottish Market but there are other options.

To what extent is WICS[931] different from OFWAT?

The basic purpose is the same, they are there to regulate prices, they are there to look out for customer interest and promote competition. When WICS was first established they followed Ofwat closely. Over the years it has diverged but remains relatively similar.

WICS has been looking to come up with things more appropriate in Scotland. Wics does not use the same incentive measures, the commonalities are very substantial however as they are using Ofwat data and Ofwat methodology. That has been a very effective tool, the success of regulatory systems depends on the people who populate the system and it has on the whole worked.

The relationship in England (with Ofwat) went from hostile to collaboration and now to hostility, the same is true in Scotland. Wics was challenging and hostile and it has matured through that, so the regulator has more confidence and trust in Scottish Water.

[931] Water Industry Comission for Scotland: (http://www.watercommission.co.uk/)

The degree to which regulator and regulatory companies behave is very important.

River Basin Management has arguably been overlooked in England with the transfer from Public to Private. How does Scottish Water ensure that the land surrounding the waterways is maintained in a sustainable way?

People say that before privatisation there was effective management system, before privatisation there was not. However there are different systems in Scotland to England. In England the Environment Agency regulates flood management and local councils have a responsibility for drainage. In Scotland SEPA have no responsibility for flood management, they are the responsibility of the council. Councils are responsible for management. It is true there are problems with this management,

One suggestion would be to create one single body that is responsible for everything; drinking, flooding, sewage etc. Politicians have always looked away as one would be creating a body that was too large but that might not be the case.

Who is responsible for the collection around the river ways and waterways, rubbish that is on the banks but not in the water?

I am not sure.

The current legislation prevents water being cut off from domestic providers if there is non payment of bills. Do you agree with this legislation?

In Scotland it is not a big problem – most people pay the council tax - - so there is effective way to collect it.

It is an interesting question though, for example if an individual pays for Sky TV and not council tax should the repercussions be harsher?

Does Scottish Water pay any form of Tax?

Yes; Corporate, National Insurance, Vat, it pays all the taxation. The tax burden is not that great due to the offset from large capital programmes.

The Scottish Water Governmental subsidy has recently been reduced. Can you give me your thoughts on why the subsidy is necessary and if the amount provided is sufficient?

What it actually is, is not a subsidy but a loan in which interest is paid. The budget is 90% from customer revenue the remaining 10% is a loan in the form of the Scottish Government. The interest is being paid on that, it is important that it is a loan. In the eyes of the Scottish Government it is shown as government expenditure, interest is paid and they are re financed.

The reduction has been mutually agreed.

Are you happy with the current legislation governing Scottish Water?

The current arrangements are satisfactory.

If any legislation were to be changed what would it be and what would it enable you to do?

Expertise in relation to exporting water is needed.

What do you perceive to be the biggest threat to Scottish Water in the Future?

The issue of climate change is one of the biggest issues the industry has to deal with at a national and international level. There is also a need to de carbonise the water industry.

In relation to climate change, most of the predictions envisage more rain. There are therefore huge implications for drainage and flood prevention and that will have to be dealt with over very many years.

The second is not a threat but a constraint and that is public ownership. we like most have a non regulated renewable power waste management and this could be grown, but the capital cant be accessed because of the

governmental restrictions. If you contrast Pennon / South West Water they were able to access capital and grow.

For all business to thrive they need to grow. We cant grow a water business in isolation so we have to grow through other routes, these are however restricted by the current legal setup of the organisation. As long as The Government own Scottish Water the Scottish government are restricting growth and the ability to access private capital. The only capital is from profits and from the Governmental Loan.

I would not want you to state that Privatisation, per se, was being advocated by me but financing it on the debt markets would be beneficial, but it needs a political will.

Where would you like to see Scottish Water in the next five and ten years?

Powers and flexibility to grow private debt finance in the business. With the stimulus for debt investors, there is real pressure there which is valuable.

You get this in a private organisation but it is impossible to completely replicate without these external pressures.

With a global drought pending what advice would you give to those managing water across the globe?

This is a very substantial issue. There is a possible market for export, but I am not convinced. The energy and the carbon cost is high and over long distances this is not the answer, on a local basis possibly but it is more about developing sustainable development, managing water use and levels. These are more likely to be the ways forward, this can be tackled in different ways producing positive results.

Appendix 1

Interview with

Lucia Susani

Manager, Water Demand Management

of

The Environment Agency

Kings Meadow House, Reading,

RG1 8QD

Email: lucia.susani@environment-agency.gov.uk

on

15, March, 2012 – Via Email

(This email has been abbreviated to include the main points.)

Interviewee Information

Water Demand Management is a department in the Environment and Business Section of the Environment Agency, a department of the British Government. This department regulates certain elements of water including pollution control.

I am forwarding some initial background information on our position on water transfers:

Below is the link to both our water transfer position statement, and the map of current water transfer schemes in England and Wales:

http://www.environment-agency.gov.uk/research/library/position/131575.aspx

You may have seen our Case for Change report, which discusses the issues of future water availability in England and Wales, and demonstrates the importance of increasing interconnection in our water supply system:

http://www.environment-agency.gov.uk/research/planning/135501.aspx

Defra, the Department for the Environment, Food and Rural Affairs, recently published "Water for Life", a document setting out the Government's vision for managing water resources into the future. The document includes the

Government's position on interconnection and water trading:

http://www.defra.gov.uk/environment/quality/water/legislation/whitepaper/

Finally, the Environment Agency is a member of the Water Resources Southeast Group, which includes the seven water companies in the southeast of England as well as other interested stakeholders. The group is reviewing the potential for joint solutions to the current water availability issues in the region, including water transfers. The report, " Progress towards a shared water resources strategy in the South East of England" is available on our website

www.environment-agency.gov.uk

Appendix 1

Interview with

Georges Mougin

Founder & Ehief Executive

of

Water and Power from Icebergs

Email info@waterpowericeberg.com

Web: http://waterpowericeberg.com

on

27 May, 2012 – Via Email

(This interview has been abbreviated to include the main points.)

Interviewee Information

Water and Power for Icebergs is a groundbreaking new enterprise, which hopes to salvage water from icebergs, bringing them to land for the use of drinking water.

Which countries would you drag the iceberg to?

South Africa , Australia , Oman, Chile, Peru and California.

Prevailing winds and currents drift icebergs Eastbound naturally, continental West Coasts are the easiest destinations .

How would you transport the water once the ice has melted?

Iceberg exploitation should take place at a certain distance from shore. Water or a slurry of ice pieces is carried to shore by an aqueduct (a sub-sea floating pipe).

Where do you see the biggest market?

South California

Have you contracted to sell the water to any countries yet?

Not yet.

Are any other organisations in competition with you?

Never heard of any.

To what extent do you believe this would aid the current shortage of global water?

It could answer the needs of coastal areas, not of the continent centers.

What do you think will be the largest change in the way in which people obtain freshwater in the future?

The largest change will be the cheap processes of ultra filtration and purification for water recycling (like on a space station).

What do you consider the largest threat to global water provision in the future?

The increase in dryness from climate change in new areas.

How much of the water supply do you believe could be from icebergs?

This is practically unlimited in the Southern hemisphere,

Antarctica yields every year more that 1000 km3 of icebergs equivalent to 10 000 icebergs of 100 Millions m3.

Appendix 1

Interview with

Frances Mildmay

Scottish Head
of

The United Nations Association

Telephone (44) (0) 141 339 5408

Email: frances.mildmay@btinternet.com

Web: http://www.una.org.uk/

on

27 March, 2012 – In Person

(This interview has not been included as requested by the interviewee.)

Interviewee Information

The United Nations Association (UNA) is a non-governmental organisation associated with the United Nations. Its remit is to enhance the support of the United Nations in its various Member States.

Appendix 1

Interview with

Dr David Benson

of

The University of East Anglia

(Yorkshire Water)

Email : d.benson@uea.ac.uk

Registered Office: Western House, Halifax Road, Bradford,

BD6 232

Telephone (44) (0) 1603 591545

on

9 April, 2012 – Via Telephone

(This interview has been abbreviated to include the main points.)

Interviewee Information

Dr David Benson lectures in Environmental Assessment at the University of East Anglia. He is also a member of RELU Rural Economy and Land Use Programme.

Why do you think Britain privatised the water system?

From memory, this was due to a combination of the perceived failure of the regional water authorities and the deregulatory, market liberalising agenda of the Thatcher government. RWAs (Regional Water Authorities), established in 1973, were given the role of regulating pollution and managing all aspects of water in catchments but this integrated approach soon ran into problems. They suffered from under funding and were not able to make adequate investments in water provision and sewage treatment. In turn, pollution from sewage works increased but the contradictory position of RWA's as regulators meant that it often went unaddressed. Pressure therefore grew to split regulatory functions (to OFWAT and the NRA in the 1989 Water Act) and water services. The Thatcher government therefore privatised the industry, ostensibly to increase accountability and allow it to raise capital for much needed investment, but also as it fitted with its free-market, neo-liberal ideology. It should however be noted that there were already a number of smaller private water companies supplying drinking water who were largely unaffected by the changes.

Apart from Political Agenda by the Government do you think there were any other interested bodies, who were pushing for privatisation?

I am sure that RWA management were keen on privatisation since all debts were written off, assets were acquired cheaply and the new companies were given tax concessions. Also, privatisation created virtual monopolies that were insulated against any competition. As profitability was guaranteed, I am sure that the financial markets were also highly supportive. Also, at the time, the public was keen to jump on the privatisation bandwagon since obtaining shares guaranteed a profitable return.

Since privatisation what positive changes have been seen?

Water charging has perhaps helped water efficiency. Also it has provided funds for greater water investments. There have also been improvements to drinking water quality and surface water from the reduction of point source pollution: one of the main issues with the RWAs.

Have there been any negative changes?

The creation of monopolies. Increasing water charges for consumers. Profiteering by water companies.

Do you believe privatisation of the water systems to be (on the whole) good or bad?

There are enough examples from other countries to suggest that publicly owned (or even public-private) water systems can be run efficiently and to the benefit of different consumers in this sense, my feeling is that on the whole privatisation as it has been conducted is a bad option since in England it has created regional monopolies with limited competition. Service provision for water (a public good) should not be driven entirely by profit but by other considerations such as public health and the environment.

In relation to catchment management what could be improved?

One issue that we looked at under the RELU project was eco-systems services payments for non-point source pollution. Here, funding for water

improvements in catchments could be leveraged from water companies to pay farmers to introduce farm best management practices as in the US and Germany. I believe South West Water were considering this option at one point.

The provision of water is very highly regulated do you consider it still to be a 'private' provision?

It just illustrates the point that water is a public good. It cannot be considered a genuinely private provision as the price and quality has to be regulated to avoid consumer exploitation. In this sense, the main theoretical rationale for privatisation (i.e. introducing a competitive market) is undermined.

Do you consider that there is 'competition' in the marketplace?

As mentioned above, privatisation effectively created private monopolies – there is little competition in the accepted economic sense since the market created is quite artificial. Otherwise there would be no need to have OFWAT to regulate prices.

Do you consider current National and European Legislation sufficient? If there were to be changes what would you suggest?

National legislation is sufficient for managing water resources. In terms of subsidiarity, this issue should be decided locally. The EU's added value is in mandating harmonised product and environmental standards for water to reduce transboundary externalities, so the balance is about right.

What do you believe successful water provision should encompass?

Managing water through public ownership of provision for the benefit of consumers and the environment, but encouraging private investment where necessary.

Do you consider the system in England as successful?

We do not have a counterfactual. It is difficult to predict the state of the industry without privatisation but in my opinion it is not as successful as it should be, mainly due to the way privatisation was conducted in 1989. It has

allowed too much money to be paid out to shareholders and not forced enough investment in managing supply.

If you were to improve the system in England what would you suggest?

Taking water provision entirely back into public ownership may be problematic and even politically undesirable. However, government could lease service provision rights to private interests on a competitive basis, ensuring their profitability, but also mandating minimum standards of service and investment.

What do you regard as the largest threat to water provision in England and Wales ?

Non-point source pollution from agriculture and climate change, i.e. qualitative and quantitative threats (see our submission to the House of Lords committee).

How do you think the drought should be tackled this year and be avoided in future years?

Climate change is predicted to lead to different, and in some areas reduced, patterns of precipitation in the UK, both seasonally and geographically. Government action is therefore required to coordinate adaptive responses both this year and into the future. These could include forcing water companies to reduce leakages from their systems, encouraging greater personal water efficiency, water transfers between regions and water recycling. Leakages are still too high, with around a third of water lost from the systems of water suppliers nationally due to leakage, although figures have declined in recent years due to greater investments by companies. Greater long term planning for future water shortages is required, from 2015 climate change adaptation will have to be incorporated into river basin management planning under the WFD (Water Framework Directive).

What global changes of water provision do you predict for the future?

Water provision will become more politically and economically significant due to climatic change, over-use, pollution and population increases.

Shifting rainfall patterns will increase the problems of water supply in many countries, including the UK. Also, water pollution is becoming increasingly significant in many industrialising countries. On a global scale, greater sustainable development of water provision through integrated, collaborative and adaptive management at catchment scales is therefore required.

Before privatisation did the national water regions pay corporation tax?

I am not sure but as public bodies the RWAs probably would not have paid corporation tax. The 29 private water companies that did exist before privatisation in 1989 would however have been liable for tax on profits.

Appendix 1

Interview with

Laurie Smith

of

The University of London

Email : ls34@soas.ac.uk

Telephone (44) (0) 20 3073 8328

on

10 April, 2012 – Via Telephone

(This interview has been abbreviated to include the main points.)

Interviewee Information

Laurie Smith is a senior lecturer at the University of London. He is the Principal Investigator for RELU and has advised a number of international bodies on water resource management including the World Bank, The Department for International Development and the Food and Agriculture Organisation.

Why do you think Britain privatised the water system?

A combination of political drivers to de-politicise large sectors of the economy and hence the power of Unions and Labour, and neo-liberal ideology and economic theory.

Apart from Political Agenda by the Government do you think there were any other interested bodies, who were pushing for privatisation?

Perhaps city interests and pension funds. Privatisation of utilities fed expansion and liberalisation of financial markets and vice versa.

Since privatisation what positive changes have been seen?

Improvements in service delivery and investment levels. Some environmental improvements, though better regulation and de-industrialisation also contribute here.

Have there been any negative changes?

A new politicisation around 'fat cats' and profits that constrains dialogue and action around regulation and investment for long term sustainability, and general discussion and action for the public good.

Do you believe privatisation of the water systems to be (on the whole) good or bad?

On the whole good (in comparison to continued national ownership of a national utility).

In relation to catchment management what could be improved?

Since 2009 OFWAT is allowing investments by water companies in catchment management, including investment on private land with private landowners.

This is a sigficant change. Such efforts need to be planned in the context of coordinated and collaborative catchment management arrangements in

which water companies are key partners, with appropriate authority delegated to the appropriate level (though scales will vary with catchments).

The Defra/EA catchment management pilots launched in 2012 will provide opportunity to develop and test such models.

The provision of water is very highly regulated do you consider it still to be a 'private' provision?

Given that large scale networked supply is a natural monopoly and the parameters/practice of current discourse then yes. But its clearly not competitive supply of a good that is in private ownership.

Do you consider that there is 'competition' in the marketplace?

Not from the perspective of the water consumer.

Do you consider current National and European Legislation sufficient?

If there were to be changes what would you suggest?

Pass

What do you believe successful water provision should encompass?

Efficient (cost-effective) service delivery and long term sustainability (environmental quality, carbon, energy etc).

Do you consider the system in England as successful ?

Relatively successful for investment and service delivery. Less successful for long term planning, environment etc.

If you were to improve the system in England what would you suggest ?

Greater accountability for water companies to communities and local government. Where the physical realities of the infrastructure allow, greater potential for alternative suppliers to compete to operate infrastructure at a local level.

What do you regard as the largest threat to water provision in England and Wales ?

Political constraints on demand management (metering and pricing), local planning constraints on new storage and climate change.

How do you think the drought should be tackled this year and be avoided in future years ?

This year requires short term restrictions on use and better public information (all depending on severity). Long term needs the combination of demand management and investment in storage including aquifer recharge.

What global changes of water provision do you predict for the future ?

Solutions need to be locally specific and well adapted. Adequate and appropriate demand management is the only universal prescription.

Appendix 1

Interview with

Richard Allison

Financial Regulation Manager

of

South East Water Limited

Registered in England No. 2679874

Registered Office: Rocfort Road, Snodland, Kent, ME6 5AH.

Telephone (44) (0) 1634 873905

Email: richard.allison@southeastwater.co.uk

on

24 April, 2012 – Via Letter

(This interview has been abbreviated to include the main points.)

Interviewee Information

South East Water Limited has a supply area of 5,657 square kilometres. Each day it supplies 565 million litres of drinking water to 2.1 million customers in the regions of; Kent, Surrey, Sussex Hampshire and Berkshire (The South of England).

Introductory Point

The current systems of water supply in England and Wales ensures universal supply for all domestic customers and has enabled the industry to efficiently raise adequate funds to ensure that the required investment over the past 20 years has been successfully achieved.

Regarding your specific questions :

What benefits do you believe privatisation has brought to the Industry?

Funding of significant capital investment (approx. £80b) over 20 years from the private sector rather than relying on public funding.

Significant improvements in operating cost efficiency over the last twenty years

Successfully achieving adequate capacity, particularly in the South East of England where there has been substantial increases in population and the number of households over the past 20 years.

Improvements in the quality of water as the industry has had to respond to a number of new EEC water quality standards.

Are you in favour of the way in which the Water Industry is regulated?

It is essential that customers are supplied with reliable and safe water. The different regulators we deal with are responsible for different aspects of our water supply. The Drinking Water Inspectorate (DWI) ensures that legally defined quality standards are achieved. The Environment Agency (EA) approve our water resource plans to ensure that adequate long term water capacity is available. Ofwat, the economic regulator sets prices and monitors our overall performance. The Consumer Council for Water (CCW) acts as a consumer body and provides an opportunity to review our strategy and interface with customers to ensure the best interests of customers are adequately considered.

Although there are at times tensions between ourselves and the regulators the system of regulation has generally worked well since privitisation. The key element of the regulatory process is probably the five year price review, which all the regulators are involved in. This process establishes our investment plan for the regulatory period and the prices required for the industry to fund the agreed investment and supply reliable and safe water to

all our customers.

Why do you believe that the best provision of services can be provided by private monopolies, which can't experience free market competition?

Free market competition would not guarantee universal supply as rational suppliers would not be prepared to sell water to non-profitable customers. Particularly as the law does not allow us to disconnect domestic customers. Is this compatible with free market competition?

The Water Industry is a long term industry requiring significant investment in long life assets. The current regime ensures that such investment is unlikely to become stranded. Individual investment plans for the current water organisations ensures that only required investment is undertaken. If complete free competition was allowed it is likely that excessive investment would take place as companies would need to develop capacity to deliver water in advance of gaining customers. This is likely to result in some investment been used inefficiently. This risk is likely to increase the cost of organisations raising funds which would potentially mean higher prices for customers or the possibility of water suppliers failing with potentially serious impacts on customers.

The Water Industry is so heavily regulated do you believe this to be a truly private system?

Most utility industries are subject to some degree of regulation. Water in England and Wales has separate quality, environmental and economic regulators. Each regulator has a different function. Quality regulation is a technical issue largely about ensuring compliance with prescribed standards to guarantee safe drinking water. The environmental regulator ensures that long term resource plans are produced. The economic regulator in the absence of a market sets prices on behalf of customers. It is hard to understand how the Water Industry could operate in the customer's interests without all these regulators.

Economic regulation incentives companies to operate efficiently. Companies will retain the benefits during each periodic review period from operating and capital efficiencies. With regard to the whether or not this is a truly private system, the Water companies are certainly private companies. As explained above an industry completely free of regulation is unlikely to be a practical option.

If you were to change something in the Water Industry what would it be?

It would be helpful if customers had a better awareness of the complexity that is involved in ensuring that when they turn the tap on they receive a high quality product and an understanding of the value of the service. The average household water bill for South East Water for the current year is £204 per annum, which at 56p per day is cheaper than a typical bottle of mineral water demonstrating the value for money our customers are receiving.

Appendix 1

Interview with

Geoff Loader

of

Southern Water Limited

Registered in England No. 2366620

Registered Office: Southern House, Yeoman Road, Worthing,

BN13 3NX

Telephone (44) (0) 1903272644

on

23 April, 2012 – Via Letter

(This interview has been abbreviated to include the main points.)

Interviewee Information

Southern Water Limited is a regional water and sewage treatment business serving an area of the south of England. It supplies water related services to around one million households.

What benefits do you believe privatisation has brought to the industry?

The benefits to the industry of moving to private sector ownership can be summed up in various ways. Here are three:

One - Benefits to Customers. The industry has been able to deliver benefits to its customers and society through big improvements in service, reliability and the health of the environment while keeping prices at reasonable levels.

Two - Access to Capital. Previously denied access to the capital markets has made possible much higher investment in assets and service standards (annual investment is routinely double that under public ownership) and allowed us to deliver badly needed improvements and grow in confidence that we are making a major contribution to economic, social and environmental sustainability.

Three - Higher Productivity. Private sector business methods have led to higher productivity and an increasingly skilled workforce. This, together with access to the markets, has made possible a doubling of investment without equivalent price increases.

Are you in favour of the way in which the water industry is regulated?

Industry regulation is complex and often experienced as a barrier to innovation. However we share the widely-held view that it has worked well for both customers and society through greater resilience and environmental improvements. In particular, together with industry management, it has contributed to a much prized industry asset: a reputation for stability that allows it to attract market funds investment at competitive rates of interest.

What is needed, and is beginning to happen, is evolutionary change in which the burden of economic regulation (which has grown a lot since privatisation) is reduced; and for the multiple regulators – Ofwat, Environment Agency, Drinking Water Inspectorate, Natural England, Consumer Council for Water and Government itself, to work more closely together to avoid conflicts that have constrained industry action in the past.

Why do you believe that the best provision of services can be provided by private monopolies, which can't experience free market competition?

We don't where it can be shown that extending market (as against comparative) competition will benefit customers without compromising the industry's capacity to fulfil its statutory obligations for service and environmental standards. There is still doubt about the potential and real concern that rapid change could damage priceless reputation for stability and affect credit ratings and the cost of capital. While there are many differences between energy and water current anxieties over security of supply and customer benefit in the de-regulated energy sector argue for a cautious approach in water. We are working with regulators and industry colleagues on the best way forward.

The Water Industry is so heavily regulated do you believe this to be a truly private system?

Yes, but we recognize that perhaps more than any other service in an advanced society water and wastewater management will (and should) always be on the political 'radar' and subject to robust regulation.

If you were to change something in the Water Industry what would it be?

Regulation would retain its present rigour to the benefit of customers, society and the industry, but become more flexible and thus more effective and cost-efficient. It would progressively move away from 'one-size-fits-all rules' towards a risk based system allowing bespoke solutions to local catchment problems agreed and implemented by the industry, its customers and regulators in partnership. Arrangements put in place by the government and the Environment Agency to meet the requirements of the Water Framework Directive, including river basin management panels and plans, should be the opportunity and we are working closely with the Environment Agency to make it happen.

Appendix 1

Interview with

James Bullock

of

United Utilities Water PLC

Registered in England No. 2366678

Registered Office: Haweswater House, Lingley Mere Business Park,

Lingley Green Avenue, Great Sankey, Warrington, WA5 3LP

Telephone (44) (0) 1925234000

Email james.bullock@uuplc.co.uk

on

9 May, 2012 – Via Letter

(This interview has been abbreviated to include the main points.)

Interviewee Information

United Utilities Water PLC is the regional water and sewage treatment business serving an area of the north west of England. It supplies water related services to over seven million individuals.

What benefits do you believe privatisation has brought to the industry?

The single most important benefit that privatization has brought to the industry is the ability to utilize private sources of finance to meet substantial funding requirements. By the end of 2012 the industry will have invested over £100 Billion in improvements since privatization, meeting formidable quality and environmental challenges. Privatisation was driven by the realization that public funding of these improvements would be unlikely to be either viable or efficient and that the required improvement in standards would not be affordable based on increases in customer bills alone. Private finance has therefore acted as a bridge, ensuring that the benefits of improvements can be enjoyed now, funded by small increases in customer bills over an extended timeframe.

Are you in favour of the way in which the Water Industry is regulated?

And

The Water Industry is so heavily regulated do you believe this to be a truly private system?

The way in which the industry is regulated, and in particular the use of the regulatory asset base, has been crucially important in ensuring that investors have had the confidence to supply these long term, low cost sources of capital. The operation of water services through regional suppliers has ensured that economies of scale and economies of scope can be maximized, whilst regulatory incentives have served to aid efficiency – and therefore value for money – for bill payers. The water industry retains a strong public service ethos and operates to the very highest standards of corporate social responsibility. However, we are unambiguously privately owned companies with responsibility to maximize long term shareholder value. We do this through optimizing use of resources in the long term interests of the stakeholders.

If you were to change something in the Water Industry what would it be?

If I were able to change one thing in the industry then I would eliminate legal and regulatory rigidities and distractions, which serve as obstacles to our focus on customer priorities. This is because despite two decades of advancement since privatization, I am convinced that there are still many improvements that we are capable of delivering to bring better service to our customers.

Appendix 1

Interview with

Kevin Whiteman

Chief Executive and Chairman

of

Kelda Water Services Limited

(Yorkshire Water)

Registered in England No. 2180706

Registered Office: Western House, Halifax Road, Bradford,

BD6 232

Telephone (44) (0) 1274 692183

Email: helen.forsyth@keldagroup.com (PA to Chairman)

on

13 June, 2012 – Via Telephone

(This interview has been abbreviated to include the main points.)

Interviewee Information

Yorkshire Water is Kelda Services Limited principal subsidiary. It Provides Water and sewage Services to around 4.7 million people and around 140,000 businesses in the North of England.

What benefits do you believe privatisation has brought to the industry?

The obvious ones are Private Money and Private Sector Philosophy. Private finance was invested after privatisation, which was badly needed. The government were constantly squeezed in terms of maintaining the expensive infrastructure and so the industry was left to rot. It (The Water Industry) was an easy one in relation to avoiding expenditure on maintenance or enhancement.

More importantly you also bring private sector philosophy. I have run government departments. In Private Sector departments you have the philosophy of the bottom line, if you save a pound you make a pound. In governmental departments, the drive is to increase your budget, so you always have more to spend. In business it is reversed. The customers also benefit because these efficiencies, made by the private sector are savings given to the consumer.

Are you in favour of the way in which the water industry is regulated?

Currently the regulatory process works and I am in favour of it.

I have one big issue and that is the lack of differentiating between high and low performing providers. The carrots are not big enough and nor are the sticks. You need value creation for shareholders through increasing charges in efficient companies and thus the profits.

The current system does not allow for companies, which are performing well, like our company to charge more from the consumer, or indeed considerably more than a company which is performing to a level of mediocrity.

Should the five yearly reviews be shortened then, to allow for a closer and more reactive way to reward and punish?

It is not necessary to move the five year price reviews, but the five year reviews have a fundamental impact on the company reviewed. If the provision is better then people should be happy to pay more, in the same way, if it is not, they should pay less and shareholders should suffer for it.

Why do you believe that the best provision of services can be provided by private monopolies, which can't experience free market competition?

I think this is the answer to the first two questions. Either you believe that that private sector can you do this or it can't. The evidence will suggest that the government can't do this efficiently, it doesn't happen because you don't have that bottom line, there is no real price for failure.

In the private sector those who reduce the budget are heroes. In the public sector those who increase the budget are heroes.

The Water industry is so heavily regulated do you believe this to be a truly private system?

Yes.

It is a private company delivering a public service. We are not subject to truly competitive services but it is private.

This is a philosophical argument. If you can provide better service on a lower cost then why would you not do this privately? This is true for any public service, philosophically I believe this to be the case.

If you were to change something in the Water Industry what would it be?

Back to the aforementioned point, it is the incentives, the gain mechanisms and insufficient drives that need to be changed.

The industry is still heavily regulated and charges are still devised by the original formula but when you look at this then small differences can have significant returns. If every bill (In our region) paid £5 more then that is £10 million that could be shared by the shareholders.

If you provide better service for customers you should both share in the gain. We as a company are successful, we like this idea. Improve and make money.

Did Water companies pay corporation tax when Public?

I don't know if they had a legal obligation to pay tax on profit, but if they did as they were making a loss, there would not be any revenue collected as there was no profit.

Appendix 1

Interview with

Tony Smith

Chief Executive

of

The Consumer Council for Water

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Email tonysmith@ccwater.org.uk

PA Cathy Hickin – Email cathy.hickin@ccwater.org.uk

Web http://www.ccwater.org.uk

on

19 March, 2013

(This interview has been abbreviated to include the main points of interest.)

Interviewee Information

The Consumer Council for Water is the only representative group for water consumers in England and Wales, which deals with complaints by customers regarding their provision.

Is the CCW the only body in England and Wales, which deals with water consumer complaints?

Yes, apart from very few specific issues where Ofwat has determination powers.

Do you think the CCW successfully deals with such complaints?

Yes. Our customer satisfaction with our service for handling complaints is currently about 78% which compares very favourably with other similar consumer bodies.

Do you believe that the private system is successful in England?

Largely. Privatisation and regulation has delivered significant improvements in service to customers and efficiency benefits. However, there is a continuing debate about the costs of further large scale capital investment and the financing of these programmes.

Do you believe that the non-private system is successful in Wales?

In many ways the system in Wales is similar to that in England, except that Welsh Water retains money on the customers' behalf rather than giving a return to shareholders. It does however, obtain loans in the same way as other companies and is treated in the same way by the regulator.

Is there a difference with the volume and type of complaints received by individuals in Wales (with a non private provider) and the individuals provided in England (with private providers)?

There are no significant differences between the complaints in Wales and those in England, although complaints in particular areas of the country can vary somewhat according to the issues locally.

What if any new duties or responsibilities do you wish to take on as suggested by the Gray Report?

We don't seek any new duties, although there is a debate about whether

CCWater should adopt some of the duties that Ofwat has to determine some of Ofwat's cases.

We are already pursuing our new responsibilities as Gray highlighted to help business customers with the transition to competition and with a bigger role in reviewing companies' tariff proposals.

How do you think your role should change in the future?

The main change that we would foresee is to do with the development of a competitive regime for business customers and the issues that would bring. We may potentially deal more with some of Ofwat's complaint issues.

To what extent has sustainable development and catchment management become more important to your organisation?

Sustainable development and catchment management are both growing issues that we advocate that water companies should pursue as alternatives

to investing in large tangible new assets. These are often better in terms of net present value and more sustainable for the environment.

How do you think the water industry should and will change in the future?

We think the water industry should have much greater focus with strong regulatory incentives on things that deliver customer satisfaction with value for money. We expect this to happen over time. In addition, there is likely to be greater focus on market solutions in upstream supplies and of course, retail competition.

To what degree do you think that that any legislation governing water or your organisation should change in the future?

There is already potential legislation going through Parliament to facilitate retail and upstream competition. If there was to be competition for domestic customers then new legislation would be required.

If regulation doesn't focus sufficiently well on improving customer satisfaction with value for money, it is likely that legislators would wish to see greater focus by the industry and by the regulator on maintaining legitimacy of the industry and its regulation in customers' eyes.

Appendix 1

Interview with

Lloyd Purnell

External Affairs Assistant

Which?

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Tel 0207 770 7263

Web http://www.whichcorporate.co.uk

on

20 March, 2013

(This interview has been abbreviated to include the main points of interest.)

Interviewee Information

Which ? is the largest product testing and consumer campaigning charity to operate in Great Britain. It engages in consumer protection issues and advocates consumer rights.

Does WHICH? or any other Consumer representation group deal with water provision complaints for either businesses or individuals?

(In addition)

Are you aware of any other Consumer group, which deals with such complaints (I am aware that the Consumer Council for Water is the NGO with responsibility over complaints)?

Which? does not currently prioritise water related issues. This is primarily because this work is done by the Consumer Council for Water (CCW) but also because we are focusing our lobbying and campaigning activities on the sectors in which we see the most consumer detriment - currently energy and banking are our main priorities. In addition, Which? is not a complaints handling organisation in any market - we do two main types of activity - testing and reviews and campaigning. CCW do deal with consumer complaints related to water.

Appendix 1

Interview with

Bruce Wilson

of

The Scottish Wildlife Trust

Harbourside House, 110 Commercial Street, Edinburgh

Email bwilson@swt.org.uk

Web http://scottishwildlifetrust.org.uk/who-we-are/

on

25 March, 2013

(This interview has been abbreviated to include the main points of interest.)

Interviewee Information

The Scottish Wildlife Trust is an environmental charity with over 30,000 members. It actively campaigns at a national level for the preservation of wildlife across Scotland.

What is the biggest water related concern which the SWT has?

Pollution of water courses through diffuse pollution

Have the problems changed in recent years or remained constant?

There are different pictures for different areas of Scotland, broadly speaking our intensively farmed areas suffer from over use of nitrogen.

Do you believe that enough is being done by governmental organisations to preserve water related environments ?

No, there needs to be less of a "slow working mentality" so that the environment (and water quality) is dealt with across government and not just past from pillar to post.

If there are problems related to water and catchment management what do you think these are and how should they be resolved ?

Better whole catchment management planning and adopting the ecosystems approach must be embraced by local and national government. Agriculture, sewage disposal and soil sealing in our urban areas is a huge problems for our "blue" environment. The Scottish Wildlife Trust would like to see the introduction of a National Ecological Network to help us plan for our green and blue environment in a similar way that we plan our towns and cities.

The banks and beds of many rivers in Scotland are not cleaned, falling between responsibility of the council, Scottish Water and other organisations - who do you think should be responsible (or indeed is responsible) for this ?

SEPA, but it needs joint action (see above point).

If you were to change any organisation or implement legislation to improve wildlife and in particular water related areas what would this be ?

Sorry I am not sure what this means.

Appendix 1

Interview with

Nigel Annett

Founder and Managing Director

of

Welsh Water

Tremorfa Industrial Estate, Rover Way, Cardiff, South Glamorgan,

CF24 2RX

Email nigel.annett@dwrcymru.com

(PA) Sue Price – Email sue.price@ dwrcymru.com

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on

17 April, 2013

(This interview has been abbreviated to include the main points of interest.)

Interviewee Information

Welsh Water is the only joint water and sewage provider in Wales.

Note – The questions asked are below, however it was a free flowing (semi – structured) interview and thus the script is typed below the questions. Although all the below questions were asked the interview reads better as a free flow, but it in practice was no different from the semi structured format used in all the other interviews. In addition to Nigel Annett Mr Heulyn Davies was also present and contributed.

Questions:

Why do you believe privatization was not successful in Wales as opposed to the providers in England?

Has privatisation been a positive thing for England and Wales?

Glas Cymru is not owned by the State would you class it as private ?

How is Glas Cymru funded, how do those investors receive a return and to what extent is that return linked to the performance of Glas Cymru?

What were the initial bond rates and range of maturities ?

Do you receive any grants loans or subsidies like Scottish Water ?

Do you believe that the bond investors of Glas Cymru create the same 'positive' pressure as share investors in a private firm ?

Glas Cymru currently provides a very high quality of water at a relatively low price. In addition to this what do you consider its greatest achievements?

Is there any difference in regulation (by regulators) in Glas Cymru from the English Providers ?

In what ways have you incorporated the methodology of 'private' sector practice into Glas Cymru ?

What do you think that English Corporations could learn from Glas Cymru?

In what areas would you like to improve in the future?

River Basin Management has arguably been overlooked in England with the transfer from Public to Private. How does Glas Cymru ensure that the land surrounding the waterways is maintained in a sustainable way?

How do you believe the relationship between landowners and managers and Glas Cymru could (or is) being improved to aid sustainable development?

Do you think the law should be changed to aid sustainable development anfd if so in what way?

Does Glas Cymru have any tax relief?

What are your thoughts on openng up the domestic (and potentially the domestic) sector to competition ?

Are you happy with the current legislation governing Glas Cymru?

If any legislation were to be changed what would it be and what would it enable you to do?

What do you perceive to be the biggest threat to Glas Cymru in the Future?

Where would you like to see Glas Cymru in the next five and ten years?

FREE FLOW:

When we started Welsh Water we outsourced everything and this worked well but over the past few years we have brought them back. In 2001 we employed 100 and now we outsource 2500 (roughly).

Outsourcing reduced our costs dramatically, but then it became inefficient.

Ownership of Welsh Water is very important people that work, there feel that they own it.

We are a Company Limited by Guarantee

The chairman (who is a lawyer) calls it ‘capitalists without shareholders’.

We (I prefer) the term ‘customer owned’ but we can be called various things.

We legally and technically a company – a private company – we don’t have dividend paying shareholders and our members – we can go bust at any time and we operate in a corporate way.

Do we need to have shareholders to maximise performance – we don’t – we can compare with the water measures as measured by the regulators (safe drinking water) for example. We sample everything and the regulator regulates. We are regulated in exactly the same way as any other company (the other 9 sewage and water providers) in England.

Our pay (across the whole company) is linked to certain performance indexes.

[Our] Pay is for example half the pay (for me and others in the firm) is roughly half that of other firms in England . I didn't want bad press about too much pay.

My pay is 50% linked to performance index. This score is known across other companies.

It was privatised in 1989 – where the government disposed of a 'liability'.

[It was worth] 250 million when privatised – and now worth 4.2 Billion – The return on capital has been rising and we have been increasing on efficiency – we save for example 5 million on transferring energy from the plant outside.

We bought it for 93% of regulatory capital value – privatisation capital + any additional investment – we bought it all with bonds 93% bonds – now it is around 63%. As we have created value. [This is 63% gearing / in debt]

What your bond investor wants is safe and steady rates (e.g. 1.2% for 50 years) – initially there was a variety of bonds and returns as we have reduced the gearing and improved credit rating everything is an A rated bond.

It is all UK Pension funds and insurance companies.

We offer a slight premium to Government Debt.

We can raise money very cheaply.

The average bill is roughly £440 (water and sewage). In 2001 we were the highest – we are still high but trying to reduce.

Our bills have fallen – we are obsessed with affordability.

We have pushed a lot of money into what customers want – private sewage systems and other strategic assets – green assets.

Our assets 25 Billion – but our assets are older than they were yesterday but in the long term we must renew the water networks.

Those who can't afford have a discount we have 55,000 on social tariffs. In Wales 14% spend more than 5% of their income on water.

When we ended the outsourcing we carried out a staff survey people were very angry that they were outsourced in different companies and this has been very much improved. 83% of employees said that they were proud to work for us. Employees think we are doing a good job for a good reason.

Customers also think we are doing well – we get high scores there too and business customers. We were recently top on the Ofwat customer survey.

Ofwat takes a sample of all of the providers and they employ a firm who are independent to interview customers and gather information on customer satisfaction.

This sounds like an advertisment and it is to a degree. Back in 2001 it was about cheap financing through the bond market but what we underestimated was the fact that ownership feeds through to commitment by employees in

the company – people like to work for a company that is not a ‘ rip off ‘ merchant.

We get no financial benefits unlike Scottish water. We raise our money from the markets. The ethos is very similar to Scottish Water. Culturally they are very similar to ourselves. I knew Richard Ackroyd and they were very keen to adopt our type of model.

The trouble of Scottish water is that they have politicians crawling all over them all day – they spend their time managing politicians. They spend time with the politicians as they [the politicians] own the company. With us our politicians they are interested in what we do but they do not interfere and they do not own ourt company.

We are a completely private entity, there is no consideration about that we are run on private capital working under license and we could go bust at any point. In every legal form we are a company.

Ownership is not an absolute. If you own a share in a company does this allow you to walk into the offices – no it does not.

Do you think this model would be successful without you an entrepreneur and a driver?

Chris Jones and Myself started this one of the biggest challenges it to continue the culture for it to run itself – my biggest worry if the board (who are independent) bring someone from outside the company who just don't get it.

In-sourcing was a very great part of creating the firm.

I feel very Welsh I am bi lingual my children are and I have 'gone native'!

Would we have done what we did it for part of England – no. It is very political, historically valleys were flooded for England [In Wales] – torn up and villagers relocated. We have a devolved government and he would say the Welsh Assembly would say from the dispute in the 1960s from water in wales – this was a big consideration for this to happen.

My business partner is also from Wales – the working language is Welsh – 1/3 [of employees] are first language is Welsh. It gives us an identity, which we are proud of.

Other companies don't have an identity that would make it possible.

We are helped by the energy companies because they outsource a lot of services like call centres to India our complaints division is manned by staff from Wales and last year we had more thank you letters than complaints.

People like us because we are non for profit and do a good job. We work because we spend 1/2 on assets (maintainance) – we deliver an affordable service – the key is having high credit ratings – finance costs low – we can invest more and reduce bills.

We have bills still higher than average.
We currently have problems with discoloured water (iron pipes).
We missed operating costs this year

The regulator does not really buy our story so we have a job to do to communicate with them.

In relation to sustainable development and land management we own quite a lot of our own catchments. We sublet some to farms there is certainly a big agenda (dissolved organics) is rising we think because of climate change – we are not sure – the old way is to focus on treatment – we are trying to improve wetlands in Anglesey – to stop runoff – we are also trying to take rainwater out of the sewage systems because of the erratic storm weather which means take the rain water from the sewage system. We are trying to prevent issues at source.

Another problem is sewage blockage (non natural products) are being flushed so we are trying to persuade young girls mainly to prevent them from throwing things in the toilet which

In Wales 1/3 are metered and all business customers.

There is no ‘right price for water anywhere’ – The rules that exist are generally something that that someone thought up – but we let sleeping dogs lie.

If there was a need or a case for us to be transferring water to the south of England I think this should be done as a public service not to make a profit, but that is coming at it as a public service. I don’t think shareholders have a part to play in this provision and I don’t think shareholders should make money from this. We have other disciplines including regulators and league tables we do not need shareholders to give us that push.

If we sold welsh water tomorrow and we could and we sold it for 5.5 Billion each Welsh individual would get £2,000 – don’t tell them though!

Politically many people in Wales agree to the way in which we are organised.

Provided performance is good people like the non for profit – but you also need a good service.

Our problem is that our regulator has a different view to us. What we tend to find is that Ofwat refuse to call our model a good outcome.

As Ofwat tries to restructure the water companies in England and tries to make them stronger I don't want politicians to have more say in the way the companies are run on a day to day basis.

They are not fans of what we have done here. It is based on competition our view is that this is a public service and we are here to look after it. This is a monopoly and we have a responsibility to do a good job for them.

The great thing about the water industry – the things that matter (most of them) can be measured in league tables – these allow us to judge performance. There are consequences and rewards. It is easy to measure things in the water industry.

The numbers are independently regulated and can be relied upon.

When other companies have problems people presume shareholders have been placed above other needs but this does not happen in our company.

Was Privatisation effective for England. Yes it was it was very very important. Taken out of politics and the public sector yes – once it was made a company it changed the dynamic completely.

Privatisation was a good thing.

The thing about Scotland – we are a commercial company commercially run but for the customers [Scotland isn't].

Appendix 1

Interview with

Professor Jeni Colbourne, MBE

Chief Inspector of Drinking Water

Of

The Drinking Water Inspectorate

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on

11 June, 2013

(This interview has been abbreviated to include the main points of interest.)

Interviewee Information

The DWI is the independent regulator with responsibility to ensure that drinking water is safe for consumers across England and Wales.

Has the quality of water improved since privatisation ?

Yes, compliance with all drinking water standards has improved from around 95% at the time of privatisation to 99.96% in 2012.

Why do you think there has been an improvement (or deterioration) ?

Improvement was due to the new regulatory regime that came into force at time of privatization, giving the independent regulator the power to require improvements.

What are your thoughts on privatisation and the efficiency of the service ?

The introduction of independent regulators and water supply companies, meant that water services were taken out of direct political control enabling access to finance at advantageous commercial rates for capital investment.

Where do you think there have been the biggest changes in provision both positive and negative ?

Companies are more responsive to customers. (Positive)

Companies have invested more in infrastructure than they have in the development of staff. (Negative)

What needs to be improved upon in the future ?

Training and development of staff.

What if any structural or legislative changes would you encourage ?

Irrespective of whether water suppliers are publicly or privately owned, it is effective independent regulation that delivers improvements.

In relation to Catchment Managements do you believe there are effective measures to protect catchments ?

There is an effective regime in place for protecting catchments but where the water supplier does not own the land, there can be difficulties in getting land owners to collaborate unless they are paid to do so; this is merely a reflection of human nature and the need for effective incentives for action.

How would you encourage water companies / land owners and individuals to work together to improve water quality and do you think new legislation should be introduced to foster closer working relationships ?

No new legislation is required.

What do you consider to be the greatest strain on the quality of water and has this changed over the past several decades ?

Water supplies are always at some degree of risk and these risks will vary over time. This is why our regulatory regime imposes a duty on supply companies to carry out a process of continuous risk assessment and risk

management.

What do you believe to be the key elements of the DWI and do you think it has succeeded in accomplishing its role ?

Independence, knowledge (substantial experience of managing water supplies is required to get a job as a drinking water inspector), appropriate powers and sanctions.

Should anything be changed within the DWI and if so what ?

Our risk based approach means we are able to adapt our approach whenever new circumstances arise (things are continuously changing).

APPENDIX 2

Global Water Statistics

The total volume of water on earth is around 1.4 Billion km^3.[932]

Of this 2.5% is freshwater and the remaining 97.5% is saltwater.

Of the freshwater 70% is in the form of ice and snow in the Antarctic and the Artic.

Around 30% of the freshwater is stored underground in the form of groundwater. This groundwater constitutes about 97% of all the freshwater that is available for human use.

Freshwater lakes and rivers contain an estimated 105,000km^3 or around 0.3% of the world's freshwater.

The total usable freshwater supply for ecosystems and humans is about 200,000 km^3 which is less than 1% of all freshwater resources.[933]

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[932] km3 is a Cubic Kilometre, the volume of a cube of side length one kilometre (1,000m) this equates also to a teralitre. (1 km^3 = 1,000,000,000m^3 = 1TL)

[933] Previous six bullets are taken from UN statistics – (http://www.unwater.org/statistics_res.html)

70% of the world's freshwater is used for irrigation, 22% is used for industry and 8% is used for domestic use.[934]

Currently two out of six people lack adequate sanitation and one out of six lack clean drinking water.[935]

[934] Taken from UN statistics: (http://www.unwater.org/statistics_use.html)
[935] World Water Council: (http://www.worldwatercouncil.org/index.php?id=25)

APPENDIX 3

The Hydrological Cycle

Water is what is termed as a circulating resource. Unlike other resources which are finite, water is reused. When water evaporates it transforms from a liquid to a gas and re condenses as a liquid. When water is used certain properties are altered, such as its purity and composition, but this is then refreshed and purified by the hydrological cycle.

The Hydrological Cycle describes the cycle in which $H^2 0$ varies in shape, size and form and migrates around the Earth's ecosphere. Water is not created or destroyed, but is transformed and transported through the Earth's biosphere, atmosphere, lithosphere and hydrosphere.

Water is stored in various reservoirs including; oceans, lakes (lochs), rivers, soils groundwater, glaciers, snowfields and the atmosphere.

The hydrological cycle takes place when the water is transformed and transported in what is termed a 'cycle' from one reservoir to another. This

continual movement of the cycle means that water is never static, a constantly changing and ever flowing element.

The stages of this continuous cycle include: evaporation, condensation, precipitation, deposition, runoff, infiltration, sublimation, transpiration, melting and groundwater-flow. Each stage plays an integral part of the hydrological cycle. This cycle cleans the substance, which is the lifeblood of the planet and its inhabitants.[936]

The water cycle is however showing signs of declining health and ever increasing competition, which is decreasing supply and increasing demand.[937]

[936] Hunnart, J "*Hydrological Cycle*" The Encyclopaedia of Earth, March 2010
[937] Postel, S "*Water for Food Production: Will There be enough in 2025?*" Bioscience, Vol 48, No 8, August 1998 : (http://www.ipicyt.edu.mx/storage-sipicyt/materialposgrado/water_food_production_in_2025_Postel.pdf)

APPENDIX 4

Water Statistics for the United Kingdom

(Rainfall / Renewable Resource / Water Usage)

Rainfall

The Average annual precipitation of the surface of the planet is estimated between 1050 mm[938] to around 1125 mm[939] depending on the academic reference.

In some parts of Scotland the rainfall was 4,000 mm but in some parts in England it was only 400mm.[940] The UK in 2011 received 1,166mm which is 194% of the 1971-2000 average.

[938] Pidwirny, M " Fundamentals of Physical Geography - Global Distribution of Precipitation." 2nd Edition, 2008
[939] Legates D et al, " Mean Seasonal and spatial variability in gauge-corrected, global precipitation." International Journal of Climatology 10 (1990)
[940] http://www.metoffice.gov.uk/climate/uk/2011/annual.html

Rainfall in 2009941	**Rainfall in MM / PA**
Egypt	51
Saudi Arabia	59
Somalia	282
Botswana	416
Finland	536
Poland	600
Greece	652
United States	715
Rwanda	1212
United Kingdom	1220
Cuba	1335
Brasil	1782
Bhutan	2200
Singapore	2357[942]
Bangladesh	2666
Papua New Guinea	3142

[941] World Bank Precipitation Chart: (http://data.worldbank.org/indicator/AG.LND.PRCP.MM)
[942] National Environment Agency Singapore: http://www.weather.gov.sg/wip/web/home/faq

Renewable Resource

The United Kingdom has an Annual Renewable Water Resource of 160.6 km3 per year. This compares to189km3 in France, 53.3 km3 in Switzerland and 24.5 in Lithuania. [943]

The total freshwater withdrawal km3/per annum in UK was 11.75 in France it was 33.16 Switzerland was 2.25 and in Lithuania was 3.33.[944]

The per capita withdrawal in m3 per annum in the UK was 197 in France it was 548, in Switzerland 348 and in Lithuania it was 971.

[943] Eurostat 2005, taken from , Gleick, P "*The World's Water – The Biennial Report on Freshwater Resources*", Island Press, 2009 The Year of estimate and most recent data from the aforementioned source is 2005 for all three countries stated. 1km^3 is a Cubic Kilometre, the volume of a cube of side length one kilometre (1,000m) this equates also to a teralitre. (1 km^3 = 1,000,000,000m^3 = 1TL)

[944] Populations of countries stated at time data was recovered: UK (circa 59.67 Million) France (circa 60.50 Million) Switzerland (circa 7.25 Million) Lithuania (circa 3.43 Million). Current populations: UK (circa 61.8 Million) France (circa 62.5 Million) Switzerland (circa 7.7 Million) Lithuania (circa 3.3 Million).

Water Usage

The use in the UK was 22% domestic, 75% industrial and 3% agricultural.

The use in France was 16% domestic, 74% industrial and 10% agricultural.

The use in Switzerland was 24% domestic, 74% industrial and 2% agricultural.

The use in Lithuania was 78% domestic, 15% industrial and 7% agricultural.[945]

[945] Gleick, P "*The World's Water – The Biennial Report on Freshwater Resources*", Island Press, 2009. Note that Year in which the previous six bullet points are as follows: UK (1994) France (2000) Switzerland (2002) and Lithuania (2003). The dates are presumably the most up to date information readily available as the Biennial Report is commonly regarded as the most up to date source of comparable statistics.

APPENDIX 5

The Factors Behind Water Scarcity

There are several factors, which are exacerbating the current water situation:

Population Growth

"Where there are few people, and a great quantity of fertile land, the power of the earth to afford a yearly increase of food may be compared to a great reservoir of water, supplied by a moderate stream. The faster population increases, the more help will be got to draw off the water, and consequently an increasing quantity will be taken every year. But the sooner, undoubtedly, will the reservoir be exhausted, and the streams only remain. When acre has been added to acre, till all the fertile land is occupied, the yearly increase of food will depend upon the amelioration of the land already in possession; and even this moderate stream will be gradually diminishing."[946]

As Malthus highlights, population Growth is a major reason why more water is being consumed. The Institute of Medicine recommends that daily water

[946]Malthus Thomas, "A*n Essay on the Principle of Population*", 1798. (http://www.esp.org/books/malthus/population/malthus.pdf)

consumption[947] should be 2.7 litres and 3.7 litres for a woman and a man respectively.[948] It should be noted however that use is different from requirement. Those in the developed countries tend to use more than is required and those in developing countries tend to require more than is used.

"*Americans use about 100 Gallons of water at home each day, millions of the world's poorest subsist on fewer than five gallons. 46 percent of people on earth do not have water piped to their homes. Women in developing countries walk an average of 3.7 miles to get water…In Florida 3,000 gallons are used to water the grass for each golf game played. US swimming pools lose 150 Billion Gallons to evaporation every year.*"[949]

In both the developed and the developing worlds the population and the need for drinkable water is increasing. From 2000 to 2010 the population increased by 16.5%.[950] By 2050 the population is expected to rise from the present 6.5 Billion to 8.9 Billion. Water use has been increasing by more than twice that of population growth. Not only is the population increasing,

[947] From all beverages and foods.
[948] Institute of Medicine, "*Report: Dietary Reference Intakes: Water, Potassium, Sodium, Chloride, and Sulfate*" Food and Nutrition Board, February, 2004
[949] "*Water Our Thirsty World*" National Geographic Special Edition, April 2010
[950] '*A Sustainable Future?*' New World (UNA –UK), Spring 2012

but more people are living in and around cities[951]. The increase in urbanisation is also having an impact on both watersheds and the population, putting a strain on the resources and at the same time increasing the demand for water[952].

Loss of Wetlands [953]

One area which is often overlooked, is loss of the natural wetlands. The wetlands are ecologically very important but many have been lost due to agricultural and industrial development or have been degraded due to water shortages. It is well known that wetlands provide many critical benefits to human society. For example wetland plants carry out photosynthesis and generate oxygen, microorganisms utilize organic substrates and maintain high water quality.

The Yellow River Delta Natural River reserve was created to protect the new wetland ecosystem and rare and endangered waterfowl, and to aid the

[951] The Climate Institute (http://www.climate.org/topics/water.html)
[952] Water Aid (http://www.wateraid.org/documents/plugin_documents/microsoft_word__urbanisation_and_water.pdf)
[953] Wetlands have been visited during the composition of this research. See Appendix 11

natural environment. When the reserve was founded in 1990, the forest covered 14,400 ha (9.4% of the reserve area) grassland covered 55,000 ha (36.2%) water surface covered 39,600 ha (25.8%) costal marsh covered 38,500ha,(25.1%) and 53000ha was considered to comprise other types (3.5%). In recent years because of little or no flow in the channel of the Yellow River the wetlands have degraded severely. It is estimated that the water body area has decreased by 10,000ha (25%) of the total previous water area of the reserve.[954]

Ensuring the future of the wetlands is vital but it is often overlooked as a long-term luxury as opposed to pressing need. Management objectives must take into consideration the future development needs and regenerations of the wetlands. This could be by separating the allocation of 'green' water to go to the environment and 'blue' water to go to other sources. The wetlands have an impact on the entire development and ecology of a watershed, which has direct impact on the individuals who dwell there. Whatever programme

[954] A management orientated valuation method to determine ecological water requirement for wetlands in the Yellow River Delta of China, by B Cui, N Tang, X Zhao and J Bai 2009 Science Direct Journal for Nature Conservation

is devised it must incorporate it. Wetland regeneration is happening in many different countries from the United States of America[955] to England[956].

Pollution

Humanity is constantly impacting and derogating the global freshwater supply with the construction of dams, reservoirs, irrigation and injecting pollutants into the soil and the water. 30 of the 47 largest rivers are now shown to be 'threatened' due to human impact, which will have an affect on almost 5 Billion people.[957]

"*We are spending trillions of US dollars to fix a problem we've created in the first place. It's much cheaper to treat the causes rather than the symptoms, which is what we do in the developed world today*." [958]

[955] See Appendix 11
[956] United Utilites (one of England's Largest Water Providers) are using their private resources to regenerate land and in turn are helping the ecosystem to naturally purify the water.
[957] "*World's Declining Rivers put 5 Billion people at Risk*." The Guardian, 30 September, 2010
[958] Vorosmarty Charles, in "*World's Declining Rivers put 5 Billion people at Risk*." The Guardian, 30 September, 2010

Pollution although mainly man made can also be a natural occurrence. The Loess plateau in China's Yellow River middle basin is one of the world's mostly badly eroded regions in the world. Extending for an area of 430,000 sq km, the Loess plateau contributes over 90% of the 1.6 million tons of the total sediment carried by Yellow River annually. The heavy siltation particularly in the lower Yellow River is dominated by aggradation. This aggradation has been caused due to increases in the silt load, resulting in the river carrying more than it can transport[959].

Man-made pollution comes in a variety of forms and is released in a plethora of ways either intentionally or unintentionally. Pollution for example may be the intentional release of untreated waste, or the unintentional leak of a harmful industrial substance. Water pollution has increased as industrialisation has increased and now that large superpowers such as India and China are currently experiencing industrialisation they are discharging correspondingly larger amounts of pollution.

In China water quality is divided into five categories that vary from good to poor, in what is labeled as poor water, one cannot, or should not use that

[959] For more information see: Shi, Changxing "*Causes for continuous siltation of the lower Yellow River*" Geomorphology 68 (213-223)

water source to support drinking or swimming. Recent studies have showed that many rivers carry water, which is undrinkable, indeed in the Hai River only 22% is considered consumable by the Chinese Government[960].

The litany of pollution problems and examples is plentiful; "*In the Ganges and Brahmaputra systems, industrial runoff has increased dramatically and the fecal coliform counts have reached crisis levels. In Pakistan an emergency was declared in Peshawar when one thousand people were admitted to hospital after drinking poisoned water caused by leaking pipelines. The Yamuna River, which passes through Delhi, receives nearly 200 million liters of untreated sewage every day. Buenos Aires treats only 2 % of its sewage…"*

Britain was for a long time known to have the dirtiest beaches in Europe. A result of direct pollution into the sea (10% of all sewage was pumped without treatment into the sea) and a lack of governmental concern. In 1975 the European Commission implemented the Bathing Water Directive[961],

[960] Hong Ying, Hu and Yu Dong, Song, "*Water Environmental Situation and Pollution Control in China"* ESPC State Joint Laboratory, Department of Environmental Science and Engineering, Tsinghua, (http://www.doc88.com/p-92232306272.html)
[961] Council Directive of 8 December 1975, concerning the quality of bathing water (76/160) EEC:

which stipulated measures of compliance for beaches which were deemed safe. In 1990 only 77% of British Beaches complied with the Directive. This can be compared with Ireland (85%), France (86%) and the Netherlands (90%). The symptoms of swimming in polluted seawater are irrefutable and dangerous and can cause a variety of infections including (but not restricted to) Typhoid, Hepatitis A and a variety of gastrointestinal diseases.[962]

Desertification

It is globally recognised that desertification is a critical threat to arid and semi – arid environments which cover roughly 40% of the global land mass and are populated by around one Billion people.[963] This term essentially describes the growth of a desert. As a process it does not have one cause, but there are various factors, which are known to increase desertification

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(http://www.environment-agency.gov.uk/static/documents/Business/Bathing_Water_Directive_1976-160_1.pdf)

[962] Walker A, "*Swimming – The Hasards of Taking a Dip, British medical Journal, January 1992: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1881469/pdf/bmj00057-0052.pdf*

[963] Veron S, et al "*Assessing Desertification*" Journal of Arid Environments, September 2006 Volume 66 Issue 4.

including the increase in population and livestock farming[964]. This human degradation of the natural environment removes the water, which would have been in fertile areas and damages not only the landscape but, the inhabitants dependent on the landscape.

Every year an area of land equivalent to that the size of Sri Lanka dries up and turns into desert. Desertification is resulting in loss of fertile land and resulting mass migration. This land is being turned into desert which causes a deterioration of land which has turned to desert and causes the release of dust which has a negative impact on the surrounding animal and human habitants and the ecosystem. If the trend of desertification is not reversed by 2020 it is estimated that 60 million people in Sub Saharan Africa alone will emigrate from these deserts to Northern Africa and Europe, thus causing ecological and political strain in those areas.[965]

[964] Dregne, H E "*Desertification of Arid Lands*" In "*Physics of Desertification*" by F L Baz, 1986
[965] Edwards, C "*Desertification"* Geographical, Feb 2005 Vol 77 Issue 2

Climate Change

Climate Change is also associated with environmental and water degradation. Climate Change poses possibly the world's greatest pending threat to water provision and food security.[966] Air pollution has contributed much to global warming because pollutants have been destroying the ozone layer. Thus which has properties, which reflect the ultraviolet radiation from the sun.[967]

"*In 1995, nearly 1400 million people lived in water stressed watersheds (runoff less than 1000m^3 /capita/year) mostly in the south west of Asia, the Middle East and the Mediterranean…In the absence of climate change, the future population in water-stressed watersheds depends on population scenario and by 2025 ranges from 2.9 to 3.3 Billion people (36-40% of the*

[966] For a detailed analysis on the potential impact on a global scale of Climate Change to water and the provision of food see: " *Climate Change, Water and Food security*." Food and Agriculture Organisation of the United Nations, 2008: (http://www.fao.org/docrep/014/i2096e/i2096e.pdf)

[967]Kibona, D, et al, "*Environment, Climate Warming and Water Management*" Volume 16, Issue 2, 2009

world's population). The estimated impact of climate change on global water resources depends least on the rate of future emissions and most on the climate model used to estimate changes in climate and the assumed future population. By the 2020s between 53 and 206 million people will move into the water stressed category and between 374 and 1661 million people are projected to experience an increase in water stress."[968]

Climate Change whether directly or indirectly linked to water is having a direct impact. The Yellow River, for example, is in an obvious warming process and has been since the 1980s. The warming trend over the Yellow River Basin is described by the increasing occurrence and intensity of hot events and reversely the decreased intensity and frequency of cold events.[969] In the Yellow River temperatures have increased, but runoff has decreased and the annual flow of the Yellow River has decreased by up to 15% in the last 50 years.[970]

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[968] Arnell, W "*Climate Change and Global Water Resources: SRES emissions and socio-economic scenarios*" Global Environmental Change, 14 (31-52), 2004
[969] Zhang, Q, et al "*Climate Change or Variability? The case of Yellow River as indicated by extreme maximum and minimum air temperature during 1960-2004*." Theoretical and Applied Climatology, 93 (35-43), (2008)
[970] Jiang, Y "*China's Water Scarcity*" Journal of Environmental Management, 90 (3185-3196), 2009

Rivers not only in China, but across the globe are being influenced by the fluctuation in their flows and groundwater recharge. Climate change is creating what has been termed as 'hot spots' by academics. These spots identify where climate change impacts on freshwater resources. In the decades to come these are a real threat to sustainable development of the highlighted locations.[971]

The rapidly growing demand for water is outpacing supply and will lead to a water deficit and a food deficit.

"*Although food security depends on a wide set of different factors and resources, the physically limited and most basic of these resources the freshwater that makes photosynThesis -based biomass production possible will introduce a fundamental constraint in some regions of the world*."[972]

As development increases the way in which water is used increases, an individual's "water footprint" grows with the swelling of his purse.

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[971] Kundzewicz Z et al, "*The Implications of Projected climate change for freshwater resources and their management*." Journal of Hydrological Sciences February 2008 (53 – 1):
(http://www.tandfonline.com/doi/pdf/10.1623/hysj.53.1.3)
[972] Falkenmark, M, et al "*Present and Future Water Requirements for feeding humanity* " Food Sec, 1 (59-69) Springer, 2009

The Increasing Water Footprint

It is estimated that 69% of world water is used for irrigation, with 15 – 35% of all irrigation withdrawals being unsustainable. [973] Irrigation increases yields of most crops by 100 to 400%. It is estimated that over the next 30 years 70% of the gains in cereal production, are estimated to come from land, which has been irrigated.[974] The water footprint of a product is the amount of water used in the creation of a product. As individuals become wealthier their eating habits change and increase.

"The World is Thirsty Because We are Hungry" Slogan for World Water Day 2012.[975]

Massive amounts of water are used in the production of everyday goods. It takes 200 litres of water (at least) to grown the ingredients, which are essential to the production of a can of Coke (the majority is attributed to

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[973] Kibona, D, et al "*Environment, Climate Warming and Water Management*" Transit Stud Review 16 (484-500), June, 2009
[974] FAO:
(ftp://ftp.fao.org/agl/aglw/docs/kyotofactsheet_e.pdf)
[975] World Water Day sponsored and supported by the United Nations:
(http://www.unwater.org/worldwaterday/index.html)

sugarcane which is very water intensive). A cup of coffee takes 140 litres of water to produce and a typical gallon of milk between 800 to 1000 gallons[976], an egg needs 200 litres and a hamburger up to 2,400 litres (150g of beef)[977].

"*The basic need is clear: Regions and municipalities must understand watersheds in truly comprehensive terms so that it might become possible to account for all the major uses of water relative to the rates at which water is replenished*." [978]

Agriculture is the largest consumer of water accounting for 70% of global consumption and 95% in many developing countries. In addition to the amount of water that an individual needs to drink it takes on average 2,000 to 5,000 litres of water to produce an individuals recommended daily food intake.[979]

[976] Senge, Peter, "*The Necessary Revolution"* Doubleday, 2008
[977] Waterfootprint.org (http://waterfootprint.org/?page=files/productgallery&product)
[978] Senge, Peter, "*The Necessary Revolution"* Doubleday, 2008
[979] Food and Agriculture Organisation: http://www.fao.org/nr/water/docs/watarataglance.pdf)

The more meat a nation produces the more water is needed. The United States for example is the world's largest beef producer[980] and produced 11.9 million tonnes in 2011. More than 9 Billion livestock are maintained to supply the animal protein consumed each year. The livestock population is around five times greater than the US human population and consume more than seven times as much grain as is consumed directly by humans. [981] Due to its high production of foods agriculture in America is particularly water intensive. 87% of all freshwater used[982] in America is used by agriculture. A large amount of this is due to the water intensive nature in the produce of livestock. Livestock do not directly consume great deal of the freshwater, indeed they only consume 1.3% (of the 87 %). It is however the complete production process, primarily the need to produce consumables for the livestock. Every kilogramme of beef takes 100,000 litres of water. This can be compared to only 500 litres required to produce the same weight of potatoes.[983] Britain's largest area of food production is cattle with their milk

[980] United States Department For Agriculture: (http://www.usda.gov/wps/portal/usda/usdahome?navid=ANIMAL_PRODUCTION&navtype=RT&parentnav=AGRICULTURE)
[981] Pimentel, D and M "*Sustainability of meat based and plant based diets and the environment*" The American Journal of Clinical Nutrition, Vol 78 No 3 2003: (http://www.ajcn.org/content/78/3/660S.full#R11)
[982] Used in any way as opposed to consumed by man or beast.
[983] Pimentel D. Livestock production: energy inputs and the environment. In: Scott SL, Zhao X, eds. Canadian Society of Animal Science, proceedings. Vol 47. Montreal, Canada: Canadian Society of Animal Science, 1997:17–26.

and meat followed by other meats including chicken and pork and then wheat.[984]

As Countries develop and the availability of meat increases so does the consumption. In America the average beef consumption in 2010 was around 85 pounds per capita whereas in China it was only 9 pounds. The population of China is the largest in the world with around 1.3 Billion, thus a percentage change in per capita consumption by only one percent would increase the demand for beef by 63,399 tonnes. [985] As China has developed, their has been an injection of wealth into the country and a growing number of people who can afford a variety of foods which were previously considered as luxuries. Diet has dramatically changed for the average citizen of China, as income has increased so has demand for greater quantity and quality of food, including meat.[986] In 1961 only 3.8kg of meat were consumed per capita in China by 2002 this had risen to 52.4. To compare this in 1961 in Great Britain the per capita consumption was 69.8 which rose

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[984] FAO (http://faostat.fao.org/site/339/default.aspx)

[985] "*Chinese Beef Consumption Trends:* Implications for Future Trading Partners" Kansas State University Department for Agricultural Economics, April 2011: (http://www.agmanager.info/livestock/marketing/bulletins_2/industry/demand/MF3000.pdf)

[986]Gale H F, "*Demand for Food Quantity and Quality in China*" USDA Economic Research Report No 32, 2007 (http://162.79.45.195/publications/err32/err32.pdf)

to 79.6 in 2001 and in America it rose from 89.2 in 1961 to 124.8 in 2001.[987] It is however the last decade, which has really seen China's consumption of beef increase by around 240% (between 1997 and 2007).[988]

China has to feed around 20% of the world's population but only has 6% of the world's fresh water supplies in addition to which it is subject to rainfall which is concentrated (60-80%) during the three month rainy season. [989]

Inadequate Water Resource Management

"*Water problems of the world are neither homogenous, nor constant or consistent over time. They often vary very significantly from one region to another, even within a single country, from one season to another, and also from one year to another. Solutions to water problems depend not only on*

[987] "Meat Consumption Per Capita", The Guardian,2002: (http://www.guardian.co.uk/environment/datablog/2009/sep/02/meat-consumption-per-capita-climate-change)
[988] Farndon J "*101 Facts You Should Know About Food"* Icon Books, 2007 and '*China Meat Demand to soar in coming decade*' China Daily, 5 July, 2010 (http://www.chinadaily.com.cn/hkedition/2010-05/07/content_9819611.htm)
[989] "*Sustainable Water in China" The China Green News* April 19 2012: (http://eng.greensos.cn/ShowArticle.aspx?articleId=605)

water availability, but also on many other factors, among which are the processes through which water is managed…"[990]

The inadequate management and provision of water, combined with pollution is arguably at the heart of the water problem. There is enough freshwater in the world for every individual not to have to experience thirst. Waste and pollution damages the already sparse resource, but water is essentially controlled by the way in which it is managed.

Water management programmes have in the past been criticised for being unsustainable both at an environmental and pecuniary level with not only a high cost for the human society but also the natural environment of that society.[991] In the 1990s Integrated Water Resource Management was popularised as a term although the concepts behind the term were not new but were not however widely practiced.

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[990] Biswas, A "*Integrated Water Resources Management: A Reassessment"* International Water Resources Association, Water International, Volume 29 June 2004. (http://galileu.iph.ufrgs.br/mendes/HIP_64/aula_2/Demandas/IWRM%20(%20Water%20International).pdf)

[991] Biswas, A "*Integrated Water Resource Management: Is it working?"* Water Resources Development, March 2008, Volume 24, No 1 (http://thirdworldcentre.org/iwrmjournal.pdf)

"*A process which promotes the coordinated development and management of water, land and related resources in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital eco-systems*."[992]

Integrated Water Resource Management was promoted as a process and therefore was continually evolving to both fit the needs of society and the environment in an efficient and sustainable way. It is a process and approach, which is open and flexible to input from various decision makers and stakeholders in order to make balanced decisions, which will have a positive impact on all of those concerned.

[992] Defined by Global Water Partnership: http://www.gwp.org/en/Press-Room/A-Water-Secure-World/)

APPENDIX 6

Bottled Water

The philosophical argument on the ownership of water can be separated into the academic and the practical. The academic concept of 'ownership' and indeed ownership of an evolving substance is continuous, complex and philosophical.[993] The practical argument to the ownership of water can be demonstrated in the bottled water market. The purchase of a bottle of water is a simple purchase of a good in exchange for value usually in the form of money. Regardless of the philosophical, the practical concept as an entity is easy to prove. It is prevalent across the globe from Europe[994] to India to America.

" *Every second of every day in the United States, a thousand people buy and open up a plastic bottle of commercially produced water, and every second of every day in the United States, a thousand plastic bottles are thrown away. Eighty-five million bottles a day. More than thirty Billion bottles a year at a cost to consumers of tens of Billions of dollars. And for every bottle consumed in the US another four are consumed around the world…This*

[993] Trelease F, "*Government Ownership and Trusteeship of Water*" California Law Review, (1957) Volume 45

[994] The sale or 'exploitation and marketing' of bottled water is considered in Directive 2009/54/EC of the European Parliament[994]

dichotomy leads to a strange reality: Suburban shoppers in America lug cases of plastic water bottles from the grocery store back to homes supplied with unlimited piped potable water in a sad and unintentional parody of the labour of the girls in Africa, who spend countless backbreaking hours carrying containers of filthy water from distant contaminated sources to homes with no water at all."[995]

America is still the majority consumer of bottled water consuming over 50% of the market share.[996] The reasons behind the consumption of bottled water vary from necessity to luxury. The movement to sell bottled water is in part being countered by various movements in urban environments to promote drinking water fountains such as the 'Find A Fountain' campaign, which promotes the locations and use of drinking water fountains.[997]

[995] Gleick P, "*Bottled and Sold"* Island Press 2010
[996] Global Industry Guide to Bottled Water (pr-inside.com): http://www.pr-inside.com/bottled-water-global-industry-guide-r688919.htm)
[997] Find a Fountain: (http://www.aquatina.com/findafountain.html)

Britain and Bottled Water

Bottled water is legislated in Britain under separate legislation from mains supplied water. Bottled Water is classed separately from mains supplied water and is considered as a 'food'. This is similar to the situation in America where bottled water and mains provided water are regulated by two different agencies. The Food and Drug Administration (FDA) regulates bottled water and the U.S. Environmental Protection Agency (EPA) regulates tap water (also referred to as municipal water or public drinking water).[998]

British Legislation includes the Natural Mineral Water, Spring Water and Bottled Drinking Water Regulations 1999.[999] Most recently, The Natural Mineral Water, Spring Water and Bottled Drinking Water (England)

[998] FDA Webpage: (http://www.fda.gov/Food/FoodSafety/Product-SpecificInformation/BottledWaterCarbonatedSoftDrinks/ucm077079.htm)
[999] (http://origin-www.legislation.gov.uk/uksi/1999/1540/pdfs/uksi_19991540_en.pdf)

(Amendment) Regulations 2010.[1000] The 1999 Legislation stipulates that bottled water shall be analyzed by the Food Authority[1001]. Extraction of water is under the control of various Local Authority Bodies (for example in Scotland the Local Council). Recognition to advertise water as Spring or Natural Mineral Water is regulated in the Act.[1002]

In Britain The Food Standards Agency have been known to recall bottled water due to contaminants.[1003]

One of the subtle disadvantages to the use of bottled water is that in many countries from Scotland to Canada the water has fluoride to prevent tooth decay. Many Mineral and Spring waters lack this fluoride and thus the additional protection to cavities is not imbibed.[1004]

[1000] (http://www.legislation.gov.uk/uksi/2010/433/pdfs/uksi_20100433_en.pdf)
[1001] Section 14 of the 1999 Act
[1002] Section 4 of the 1999 Act
[1003] Food Standard Agency – Archives: http://tna.europarchive.org/20110116113217/tna.europarchive.org/20110116113217/http://www.food.gov.uk/news/newsarchive/2002/nov/cotswater)
[1004] Smith M "Bottled Water Cited as Contributing to Cavity Comeback" Perelman School Of Medicine, September 2005: (http://www.medpagetoday.com/PrimaryCare/DentalHealth/1756)
See Also Lalumandier J *"Fluoride and Bacterial Content In Bottled Water vs Tap Water"* Arch Fam Med, 2000 Issue 9: (http://courses.washington.edu/h2owaste/bottled_water.pdf)

The bottled water industry is above $3.4 Billion and was growing at rate of 9% per year.[1005] It is estimated to be around $65.9 Billion by 2012[1006]. Recently there have been fluctuations in growth[1007] but these may be connected with the recession as overall market growth has on the long term increased incrementally. For example the compound annual growth rate from 2004-2009 In the US was 4.4% in China it was 12.3 % and the world total was 5.5%[1008]

The Natural Resource Defense Council have stated that ; There are no assurances that because water is labeled as 'Spring' or 'Mineral' that the water is cleaner or better for individuals than most tap water.[1009]

[1005] Lezener R, "*A Monster Beverage Event*" Forbes, 20 October 1997: (http://www.forbes.com/forbes/1997/1020/6009064a.html)
[1006] "*Global Bottled Water Market to Reach $65.9 Billion by 2012, According to a New Report by Global Industry Analysts, Inc*", PR Web, November 2008 (http://www.prweb.com/releases/bottled_water_sparkling/mineral_water/prweb1584664.htm)
[1007] Alsever J "*Bottled Water Sales Dry Up; Industry asks why* " NBC (http://www.msnbc.msn.com/id/34451973/ns/business-going_green/t/bottled-water-sales-dry-industry-asks-why/#.T1D1Qs3qrdE)
[1008] Rodwan J "*Challenging Circumstances Persist Future Growth Anticipated*" International Bottled Water Association Report 2009: (http://www.bottledwater.org/files/2009BWstats.pdf)
[1009] Natural Resource defense Council: http://www.nrdc.org/water/drinking/qbw.asp)

Bottled water may be the only global element of water, which is globally private. This however undisputed commodity can by no means define what is considered as water privatisation.

APPENDIX 7

Table of Water Companies

In

The United Kingdom of Great Britain and Northern Ireland

Information 2011/12

Water and Sewage Company (WASC)
Water Only Company (WOC)

Information collected from: Companies House and individual company registered offices and websites.

Company	Type	Ownership
ENGLAND AND WALES		
Anglian	WASC	Osprey (UK, Private Equity)
Dwr Cymru	WASC	Glas Cymru Cyf (UK Private Company)
Northumbrian and Essex & Suffolk	WASC	Northumbrian Water Group Plc (Chinese, Private Equity)
Severn Trent	WASC	Severn Trent Plc (UK Listed Company)
South West	WASC	Pennon Group Plc (UK Listed Company)
Southern	WASC	First Aqua (UK, Private Equity)
Thames	WASC	Macquarie (Australia, Private Equity)
United Utilities	WASC	United Utilities Plc (UK Listed Company)
Wessex	WASC	YTL Holdings Bhd (Malaysia Listed

		Company)
Yorkshire	WASC	(Saltire, UK Private Equity)
Bournemouth & West Hants	WOC	Cascal NV / Biwater Plc (USA Listed Company)
Bristol	WOC	Aguas de Barcelona (Spanish Listed Company)
Cambridge	WOC	Cheung Kong Infrastructure (HK Listed Company)
Cholderton	WOC	Cholderton Estate (UK Privately Held Company)
Dee Valley	WOC	Dee Valley Holdings Plc (UK Listed Company)
Veolia Water Southeast	WOC	Veolia Environment SA (France Listed Company)
Portsmouth	WOC	South Downs (UK, Private Equity Company)
South East	WOC	Westpac (Australia, Private Equity)
South Staffordshire	WOC	Alinda (USA, Private Equity Company)
Sutton and East Surrey	WOC	Terra Firma (UK, Private Equity)
Veolia Water East	WOC	Veolia Environment SA (France Listed Company)
Veolia Water Central	WOC	Veolia Environment SA (France Listed Company)
SCOTLAND		
Scottish Water	WASC	Statutory Corporation

		(State Owned Corporation)
NORTHERN IRELAND		
Northern Ireland Water	WASC	Government Owned Company

APPENDIX 8

Table of Water Company Websites

In

The United Kingdom of Great Britain and Northern Ireland

Company	Website
ENGLAND AND WALES	
Anglian	http://www.anglianwater.co.uk/
Dwr Cymru	http://www.dwrcymru.com/
Northumbrian and Essex & Suffolk	http://www.nwl.co.uk/your-home.aspx
Severn Trent	http://www.stwater.co.uk/
South West	http://www.southwestwater.co.uk/
Southern	http://www.southernwater.co.uk/
Thames	http://www.thameswater.co.uk/
United Utilities	http://www.unitedutilities.com/
Wessex	http://www.wessexwater.co.uk/
Yorkshire	http://www.yorkshirewater.com/
Bournemouth & West Hants	http://www.sembcorpbw.co.uk/
Bristol	http://www.bristolwater.co.uk/
Cambridge	http://www.cambridge-water.co.uk/
Cholderton	http://www.choldertonwater.co.uk/
Dee Valley	http://www.deevalleywater.co.uk/
Veolia Water Southeast	https://southeast.veoliawater.co.uk/
Portsmouth	http://www.portsmouthwater.co.uk/
South East	http://www.southeastwater.co.uk
South Staffordshire	http://www.south-staffs-water.co.uk/
Sutton and East Surrey	http://www.waterplc.com/
Veolia Water East	https://east.veoliawater.co.uk/
Veolia Water Central	https://central.veoliawater.co.uk/index.aspx

SCOTLAND (Domestic Only)	
Scottish Water	http://www.scottishwater.co.uk/
NORTHERN IRELAND	
Northern Ireland Water	http://www.niwater.com/

APPENDIX 9

Countries with Ownership interest not in the UK

Information collected from: Companies House and individual company registered offices and websites.

(2011-12)

Country (Of Ownership)	Provider	Ownership (Of Provision)
AUSTRALIA	Thames	Macquarie (Australia, Private Equity)
	South East	Westpac (Australia, Private Equity)
FRANCE	Veolia Water South East	Veolia Environment SA (France Listed)
	Veolia Water East	Veolia Environment SA (France Listed)
	Veolia Water Central	Veolia Environment SA (France Listed)
CHINA/HONG KONG	Northumbrian Water	Cheung Kong Infrastructure (HK Listed Company)
	Cambridge	Cheung Kong Infrastructure (HK Listed Company)
MALAYSIA	Wessex	YTL Holdings Bhd (Malaysia Listed Company)
USA	Bournemouth and West Hants	Cascal NV / Biwater Plc (USA Listed Company)
	South Staffordshire	Alinda (USA, Private Equity)
SPAIN	Bristol	Aguas de Barcelona (Spanish Listed Company)

APPENDIX 10

Share Prices

The below are the stock of the Water and Sewage and Water Companies which are listed on the Public Stock Market (LSE).

All other Providers are either owned by a Foreign Market or are Private.

Share (Stock) Prices are rounded.

All information has been gathered from company reports.

Prices are in pence (Sterling)

COMPANY	EPIC	2004 (January)	2012 (January)
Severn Trent	SVT.L	1100	1500
Pennon (South West Water)	PNN.L	240	710
United Utilities	UU	450	615
Dee Valley Holdings	DVW.L	700	1350

Increase in Stock Price as a Percentage 2004 – 2012.

COMPANY	INCREASE
Severn Trent	36 %
Pennon (South West Water)	196 %
United Utilities	37 %
Dee Valley Holdings	93%

APPENDIX 11

Listed UK (England) companies 2011 Revenue and Profit

Information collected from: Various Financial and Annual Reports.

COMPANY	EPIC	Revenue 2011	Profit Before Tax
Severn Trent[1010]	SVT.L	£ 1,711.3 M	£ 253.0 M
Pennon (South West Water)[1011]	PNN.L	£ 1,159.2M	£ 188.5 M
United Utilities[1012]	UU	£ 1,513.3 M	£ 596.4 M
Dee Valley Holdings[1013]	DVW.L	£ 21.35 M	£4 M

[1010]Financial Report: Severn Trent (http://www.severntrent.com/upload/pdf/2012-Annual-Report-and-Accounts.pdf)
[1011] Financial Report: Pennon Group (http://www.pennonannualreport2011.co.uk/)
[1012] Financial Report: United Utilities (http://annualreport2012.unitedutilities.com/documents/Interactive_AnnualReport_FINAL.pdf)
[1013]Financial Report: Dee Valley (http://www.deevalleygroup.com/media/2997/annualrep2011.pdf)

APPENDIX 12

Private Purchase Example

Northumbrian Water Group

Many previously public listed companies are now being purchased by private investors and are thus becoming unlisted stocks.

One of the most recent being Northumbrian Water.

All below information gathered from Northumbrian Water Group Annual Reports[1014]:

Northumbrian Water Group was purchased into private ownership. It produced years of high performance.

Not only was there high customer satisfaction from the product purchased, but environmental targets were being met. (85% of customers thought the service provided value for money and overall satisfaction reached 89%)

Profitability was also at a high:

Financials: 2011

Revenue	Profit Before Interest	Profit Before tax	Profit for the Year
£738.1 M	£304.2 M	£181.0 M	£178.4M

Financials: 2010

Revenue	Profit Before Interest	Profit Before tax	Profit for the Year
£704 M	£275.8 M	£170.2 M	£122.9 M

[1014] All Financial Reports can been seen at the following link: (http://www.nwg.co.uk/Downloadlibrary.aspx)

APPENDIX 13

STAFF Employed & Contracted

This is a chart showing the employment figures of the ten water and sewage providers in England and Wales between 2002/3 to2010/11.

Information provided by Ofwat: (David.Russell@ofwat.gsi.gov.uk)

Employed Staff

Employee	2002/3	20011/12
Anglican	3,531	3,654
Welsh Water (WW)	143	1,814
Northumbrian	2,320	2,767
Severn Trent	4,821	5,128
South West	1,388	1,195
Southern	2,029	1,562
Thames	4,680	4,805
United Utilities	3,212	4,631
Wessex Water	1,408	1,664
Yorkshire	2,151	2,341
Minus (WW)	25,683	27,863
Total	25,683	29,561
Minus (WW)		8.5%
Increase		15%

The first figures exclude Welsh Water (WW)

Contracted Staff

Contractor	2002/3	20011/12
Anglican	0	1,861
Welsh Water	3,514	2,124
Northumbrian	875	1,010
Severn Trent	N/A	N/A
South West	0	1,752
Southern	0	1,341
Thames	0	1,818
United Utilities	0	1,684
Wessex Water	0	372
Yorkshire	0	1,345
Total	4,389	13,307
Increase		203%

Note that statistically the increase in Contractors has risen from 2002/3 to 2010/11 by 1205%. This figure however needs to be considered with the information that Severn Trent considers any individual who serves the company, and is not under their employ, as a contractor. Thus the high contractual number of 43,976 (Employees are 5,128) has not been included in the chart.

APPENDIX 14

Fieldwork – RELU

(During November and December of 2010)

During the winter of 2010, the author was asked by Cornell University to travel to London to aid and attend in a workshop and conference related to Water Management.

The Conference was titled; "*Workshop on Approaches to Integrated Catchment Management – Learning from International Experience*." The Conference preceded a Workshop, lead by RELU (Rural Economy and Land Use Programme) titled; "*Catchment Management for Protection of Water Resources*".

The Conference was on 29 November 2010. The Workshop was on 30 November.

(A Report of the aforementioned was published and can be viewed on

PDF form, via access from the internet.[1015])

In addition and importantly there was a discussion with DEFRA and the Environment Agency on 30 November during the Workshop. This was during the drafting of their White Paper[1016] entitled aptly The Natural Choice.[1017]

The following combines a summarised version of the author's personal notes, The Catchment Management Template Presented by RELU[1018], and the Report as drafted by Porter et al.

In addition the Principal Investigator of RELU Laurence Smith has been

[1015] Porter, Smith, Dobtsis "*Workshop report Approaches to Integrated Catchment Management Learning from International Experiences 30th November 2010 / Follow – up to the Conference on 29th November 2010 on: Catchment Management for Protection of Water resources Rural Economy and Land Use Programme Project*.":
(http://www.watergov.org/documents/30Nov10WshopReportCHrule.pdf)
[1016] A White Paper, although not legislation is the precursor to legislation and much of what is included in a white paper will be incorporated in future legislation.
[1017] "The Natural Choice: Securing The Value of Nature" DEFRA (2011) :
(http://www.defra.gov.uk/environment/natural/whitepaper/)
[1018]Smith Laurence, Principal Investigator for RELU, Presented at the RELU Conference aforementioned (29 November, 2012) :
(http://www.watergov.org/documents/Catchment_Template%204%20page.pdf)
In addition The Ecosystem Health Report Card, presented at the same conference can be viewed at the link below:
(http://www.watergov.org/documents/RELU%20PP7%20final.pdf)

interviewed, as has Dr David Benson.[1019]

Conference and Workshop

The Conference on 29 November was a platform for a variety of different National and International experts to discuss their work and propose catchment management methodology.

The remit of the workshop on 30 November was to ascertain and evaluate a series of different approaches to managing land within a catchment, through the input of a variety of experts, stakeholders and government officials.

In addition to:

Consider competing stakeholder concerns and demands.

To evaluate, a variety of different approaches from across the globe.

Representatives from a variety of different countries would have the opportunity to learn from each other. (Some of the countries included were: Great Britain, Germany, The Netherlands, Denmark, The United States and

[1019] See Appendix I (Interviews)

Australia). Such combined knowledge would be used to help each country including Great Britain.

To assess the various different methods of inter country governance and how these may be applied to Great Britain.

To allow various members of the community who were affected by a variety of different factors to voice their concerns and propose suggestions to governmental and non-governmental groups.

The workshop importantly included members of the Department for Food Environment and Rural Affairs (DEFRA) and the Environment Agency (EA).

This was a truly holistic exercise and experience which allowed various stakeholders from farmers and land owners, to the Rivers Trust to voice their opinions and concerns to the government through the representation of DEFRA and the EA.

Catchment Management Template[1020]

Catchment Management is a continuously evolving issue in society which has to continuously battle with erratic weather, changes in land use and the increased use of new farming techniques and chemicals.

To create a template is a task in itself, which has to continually change with the new externalities habitually impacting the catchments. In addition what one must consider is that each catchment (which includes sub-basins and tributaries) and each stakeholder in the catchment has different and subjective opinions about that management. With this caveat considered, the Template highlights important factors, which should be heeded.

The Principal and the starting point for any catchment management is to start with those involved in the catchment. By involving those who have an interest in the catchment and encouraging those stakeholders to participate in the management of the catchment is vital. Through an integrated partnership the management can grow and indeed without an integrated

[1020] Smith Laurence, Principal Investigator for RELU, Presented at the RELU Conference aforementioned (29 November, 2012) : (http://www.watergov.org/documents/Catchment_Template%204%20page.pdf)

management there would not be the necessary tools, or knowledge to initiate full and efficient catchment management.

The management of a catchment is indeed a constantly evolving and complicated process, but like many things by utilising the power and knowledge of multiple individuals the management becomes an achievable if ever evolving goal. Although, an integrated partnership seems like a very convoluted way for anything to get processed. If this is done at a macro and then a micro level then the sub division becomes natural and in turn efficient. An example would be the utilisation of experts by large corporations such as South West Water (as can be seen by the Interviews[1021]). South West have been allowed to provide catchment management through utilising experts in the Rivers Trust. This form of outsourcing allows South West water to focus on provision and allow experts in catchment management to improve the catchment.

Once there has been an integrated partnership established, then that partnership needs to do two important things. It needs to highlight problems

[1021] Appendix 1

(present and future) and in addition to this it needs to prioritise the problems and ascertain the best solutions.

From this Problem (Identification - Prioritisation – Rectification) flows the next stage, which is planning the rectification “Design and Planning”.

Naturally from the design follows implementation.

Importantly the final (or initial stages of the next implementation) is when the Plan is: Assessed , Adjusted and Improved upon.

This plan accepts the nature of the catchment and is built as flexible as possible to allow necessary improvements.

Importantly this flexibility is in essence the key component of the plan.

Conference and Workshop Analysis[1022]

The Conference highlighted certain issues, which are summarised below:

Stakeholders are not sufficiently integrated into a catchment management system.

The decision making process in relation to catchment management needs to become more transparent.

The funding of the catchment needs to become transparent and accessible.

More funds should be provided, be this through Land Owners, Providers or directly through Government or Governmental Agency.

Local interests must be taken into consideration.

[1022] Porter, Smith, Dobtsis "*Workshop report Approaches to Integrated Catchment Management Learning from International Experiences 30th November 2010 / Follow – up to the Conference on 29th November 2010 on: Catchment Management for Protection of Water resources Rural Economy and Land Use Programme Project*.": (http://www.watergov.org/documents/30Nov10WshopReportCHrule.pdf)

Development of new national partnerships at a national scale must incorporate existing local and community partnerships.

Catchment management should include areas which have until recently been overlooked such as flood management and water quality.

Environmental Institutions, Government bodies, Water Providers and Communities should be in a position where they can work easily together and importantly be able to share information.

From a bottom up catchment operation the land owners would directly be able to prevent pollution at source, which would not only help the environment but save the water company costs.

From this at a Governmental level DEFRA can aid the process of Catchment management by helping to implement the above points. In addition DEFRA could:

Offer specific funding

Manage (or facilitate the management) certain elements of catchment Management.

Ensure provision of adequate monitoring or maintenance.

Ensure that all stakeholders are utilised to produce the most efficient catchment partnerships.

Conclusion

In essence the fact that such Workshops and Conferences are being attended by governmental personnel is, in isolation, a positive thing and means that those who should be interested in the management of the catchment, at least appear to be communicating with those involved.

In June of 2011 The White Paper "The Natural Choice"[1023] was published and was seen by many in the industry to be a very positive step towards integrated catchment management (as discussed).[1024] There is a considerable

[1023] "The Natural Choice: Securing The Value of Nature" DEFRA (2011) : (http://www.defra.gov.uk/environment/natural/whitepaper/)

[1024] This is discussed in the main body of the thesis. This appendix only focuses on the experience and information gathered from the Conference, Workshop and dealings with RELU.

amount to be tackled, but this appears to be the first step in the right direction.

APPENDIX 15

Fieldwork - Crete

(During the summer months of 2010)

During the summer of 2010, the author was asked by Cornell University to travel to Crete and study the legislation and water management of the Municipality of Neapolis.

The author was the one legal representative in the team which was additionally comprised of two professors one from Engineering (Professor Tammo Steenhuis) and Professor Gail Holst-Warhaft (Director of the Mediterranean Studies Initiative) and two postgraduate students who have a focus on water (one from Engineering and the other from Human Resources).

The work was carried out in the summer of 2010 and was published in 2011 in Greece. "*Water on the Brink: A Water Profile of Neapolis, Crete,* "[1025]

[1025] Saia, Kurth, Bowes, Holst-Warhaft and Steenhuis "*Water on the Brink: A Water Profile of Neapolis, Crete, Greece"* Published by the Greek Government a copy of which can be sent by contacting the Author of this text.

This Appendix has been collated from information gathered during this fieldwork.

The author was asked to accompany the party from Cornell for two reasons: To assess the legal structure and efficiency of the water provision and legislation and its compliance with international stipulations. In addition, as an informative addition for the construction of this Doctoral Thesis, as the system in Greece is public, whereas the system in England and Wales is private.

This information has been added as an appendix as opposed to being included in the main body of the text and should be read as an informative addition as opposed to a comparative analysis.

European Legislation

Laws governing the Municipality of Neapolis, Crete, are compelled to be in alignment with European Legislation as are all Member States including England and Wales.

The Principal European Legislation governing various European countries' water including Greece (and England) is called the Water Framework Directive.[1026]

This directive was established to protect: Inland Surface Waters, Groundwater, Transitional Waters and Coastal Waters.

This Framework-Directive has a number of objectives, such as preventing and reducing pollution, promoting sustainable water usage, environmental protection, improving aquatic ecosystems and mitigating the effects of floods and droughts.

[1026]Although there are other Water Directives which have been mentioned previously in this work the Framework Directive has been arguably the most important and difficult for the Member States to implement and ratify:
Directive 2000/60/EC of the European Parliament and of the Council of 23 October establishing a framework for Community Action in the field of Water Policy.

Its ultimate objective is to achieve "good ecological and chemical status" for all Community Waters by 2015.

The European legal concept of 'direct effect' applies not only to Regulations but also Directives.[1027] This imposes an obligation for each Member State to ratify the principles narrated in each Directive. This should be done by the transposition of the Directive into National Law. This applies equally to Greece and England.

(As has been stated England is now in almost complete compliance with the Directive.)

National Law

The Greek Law 3199/2003 (later amended[1028]) was the initial legislative attempt to harmonise the Water Framework Directive. Greece was held by the European Commission to have violated the Water Framework Directive.

[1027] Grad v Finanzamt Transtein, Case 9/70 [1970] ECR 825

[1028] The aforementioned legislation was amended by articles 9.1 and 13 of Law 3481/2006. The two primary aims of the amendments were; to allow transfers from water basins and to legalise the proposed works diverting the flow of the Acheloos River.

Violations

In 2005 an infringement process was initiated against Greece and in 2006 the European Commission referred Greece to the European Court of Justice, due to the ongoing delays in implementing national legislation permitting the adherence of the principles of the Water Framework Directive.[1029]

Presidential Decree 51/2007 was passed in order to fully align the provisions, including technical specifications of the Water Framework Directive with National Legislation.[1030]

The European Commission were persuaded that the Decree satisfactorily solved any gaps in previously passed national legislation and enabled Greece to conform to the Water Framework Directive, thus closing the case in June 2007.

[1029] 'Commitments Without Implementation: The status of environmental legislation in Greece', WWF, Athens, July 2007.

[1030] Presidential Decree: This is a decree issued by the President not the Parliament, (i.e. the administration not the legislation).

Greek legislation is voted directly by the parliament and no decree may be issued unless a law provides for its issuance (usually laws may contain clauses to say that; "a decree may be issued on this matter to provide detailed regulations".
A decree establishes rights and obligations and has the same standing as legislation passed by Parliament.

The European Commission published a report during March of 2007, which examined the implementation of the Water Framework Directive in relation to the various Member States. The report shows that Greece has also violated the Directive in other ways such as providing reports (as directed in Article 5 of the Directive) a year after the requested deadline.[1031]

This problem persisted and the most recent European Commission report showed that all Member States have reported on the establishment of monitoring programmes in accordance with Article 8 and Annex V (of the Directive), with the exception of Greece, which has not reported and Malta, which has not reported on surface water monitoring programmes.[1032]

England and the other European states by this time had passed adequate legislation that was seen by the EC to be in compliance with the Water Directive.

[1031] Commission Staff Working Document, accompanying document to the communication from the Commission to the European Parliament and the Council 'Towards Sustainable Water Management in the European Union' First stage in the implementation of the Water Framework Directive 2000/60/EC [COM (2007) 128 Final] [SEC (2007) 363].

[1032] Commission of the European Communities, Report from the Commission to the European Parliament and the Council in accordance with article 18.3 of the Water Framework Directive 2000/60/EC on programmes for monitoring of water status {SEC(2009)415} http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0156:FIN:EN:PDF

Local Legislation

From an International level to a local level, the Municipalities such as Neapolis, in Crete, is governed by four main legislative provisions from international to local.

The Water Framework Directive (International)

National Legislation 3199/2003 (National)

Presidential Decree 51/2007 (National)

Regulation on Water Provision Use and Sanitation (Local)

The Articles in the Water Framework Directive are superior and supersede any legislation beneath it.

Regardless of the previous and ongoing reluctance of Greece to fully comply with European Legislation, currently the European Commission are satisfied that the National Legislation 3199/2003 paired with Presidential Decree. 51/2007 satisfies the Directive's goals, considering the compliance in duties and responsibilities of this legislation is another issue.

The ultimate objective of the Directive is to achieve good ecological and chemical status for all community waters by 2015. This is to be done by such measures including; reducing pollution, promoting sustainability, improving the aquatic ecosystems and abating the consequences of overly wet and overly dry periods.[1033] These general goals are given specifics in what should be accomplished and importantly what should be monitored[1034] and reported[1035].

National Legislation 3199/2003 and Presidential Decree 51/2007 supply general rules in compliance with the directive and specifically give authority and autonomy to specific Regions (As defined by the National Water Commission) which empowers those Regions to govern the protection and management of the river basin within that Region.[1036]

[1033] 'Europa' Summary of Legislation (Water Framework Directive): http://europa.eu/legislation_summaries/agriculture/environment/l28002b_en.htm
[1034] Directive 2000/60/EC of the European Parliament and of the Council of 23 October establishing a framework for Community Action in the field of Water Policy – See Article 8 (Monitoring of surface water status groundwater status and protected areas).
[1035] Directive 2000/60/EC of the European Parliament and of the Council of 23 October establishing a framework for Community Action in the field of Water Policy. See Article 15 (Reporting).
[1036] Law 3199/2003 "Protection and Water Management Harmonization with the Directive 2000/60/EC of the European Parliament and Council of October 23 2000" - See Article 5 Section 1.

Crete, which is one of the aforementioned Regions in turn has allotted the task of water provision use and sanitation legislation to its component Municipalities.

The Municipality of Neapolis' water provision, use and sanitation is governed by a single Regulation, which was given effect on the 1st of April 2007. It has 30 Articles and is the document ,which governs the Municipality and the City of Neapoli.

The local regulations, which govern the Municipality of Neapoli work well at governing the local needs of the people. They do not however cover all that would be required to fulfil the obligations which Europe imposes through the (WFD). The Monitoring of surface water status and ground water status (WFD Article 8) for example is not incorporated into regional legislation. This is however the obligation of the National Government to request information. For example information is required by Europe from Member States on 'the ecological and chemical status and ecological potential' of surface water and 'the volume and level or rate of flow to the extent relevant for ecological and chemical status and ecological potential.' (Article 8)

It should be noted that just because there is an European obligation to monitor and report at a National level, the lack of fulfilling this obligation may not have a negative impact at a local level.

The Local regulations, governance and management (which is controlled by council headed by the Mayor) has thus far been more than satisfactory, indeed for such an arid region it should be complimented. This is not to say that if it were to be managed in a different way and the local legislation either varied or ignored that, there would not be problems in the future.

Due to a variety of reasons England has fulfilled its various duties such as the constant reporting at a local and national level.

Any answer to determine why one nation fulfils an obligation when another does not is hypothetical. However there are some possible reasons why the United Kingdom has fulfilled its obligations:

The structure of the system in England and Wales places the responsibility on corporate providers who are under statutory duties. A breach of those duties would mean a fine imposed by Ofwat.

In addition culturally the British are known for their bureaucratic tendencies which have developed over centuries of national and international reliance on their civil servants.

Observations

At a National Level, Greek Legislation is now in compliance with European Legislation, namely the Water Framework Directive.

Obligations, which are imposed at a National Level to comply with European standards and requirements to produce reports are not being complied with. These reports include data from the various regions of Greece including Crete. This obligation is a National one, but requires local assistance, for example National reports must be provided on surface water monitoring programmes. Such programmes do not need to be incorporated into local legislation, but indeed they may.

Either local legislation of each district could be extensively extended to ensure that the National government has the information needed to provide to comply with European Standards, or the local legislation could remain in its basic but efficient form and the National government should collect the information required without complicating the local legislation and administration, the latter being the preferred option.

The local legislation of many localities (including Neapolis) is basic, but the system has produced a well managed and uncomplicated system of water provision.

At a Local community level, where factors such as pollution reduction are not pressing concerns, due to the little pollution incurred in the location studied, there are two factors of importance; provision and price. Price is just under one euro per cubic meter. At a comparative level, Thames Water[1037] in England charges just over one pound sterling (and an annual fee of £2,000). Thus considering the amount of extra money needed in the cleaning and provision of water in central London and the other regions which Thames supply, the disparity is not great. Importantly Thames water is a very

[1037] Metered Charges 2011 – 2012.
(http://www.thameswater.co.uk/cps/rde/xbcr/corp/201112-metered-charges-leaflet.pdf)

profitable company which receives no state receivables. In Greece however, Thessaloniki Water Supply and Sewage Company (EYATH) receives 60 Million Euros from the state per year and Athens Water Supply and Sewage Company (EYDAP) receives around 300 Million Euros.[1038]

The Greek Nationalised Monopolies are now however being sold to reduce the deficit and increase the efficiency and profitability of production.[1039]

"*The plan to sell up to 40% of the Thessaloniki Water Supply and Sewage Company (EYATH) and up to 27% of the Athens Water Supply and Sewage Company (EYDAP) forms part of a wider austerity package announced by finance minister George Papaconstantinou on 23 May, which is designed to raise €50 billion through privatisations alone by 2015*."[1040]

[1038] "*Ambitious Timing For Greek Water Sell-Off*" Global Water Intelligence, June 2011, Vol 12 Issue 6: (http://www.globalwaterintel.com/archive/12/6/general/ambitious-timing-greek-water-sell-.html)
[1039] Hoffman Julian, " The Big Greek Sell-Off" Investors Chronicle, 25 May, 2011.
[1040] "*Ambitious Timing For Greek Water Sell-Off*" Global Water Intelligence, June 2011, Vol 12 Issue 6: (http://www.globalwaterintel.com/archive/12/6/general/ambitious-timing-greek-water-sell-.html)

APPENDIX 16

Fieldwork/Discussions – Wetlands

The Lodge of Jim Curotolo

(Various visits during September 2009 and 2010)

"*Wetlands do not just do one thing. They perform many processes simultaneously and therefore they provide a suite of values to humans*."[1041]

Wetlands are important for a variety of reasons including; flood control, silt filtering, the provision of a healthy natural habitat for all life forms and pertinently as a water cleanser:

"Wetlands fed by groundwater further transport the water to streams that may otherwise dry up during warm summers or times of drought. Furthermore, wetlands absorb water during the wet seasons and gradually release it during dry seasons, and can thereby refill aquifers and other drinking water supplies. Wetlands not only supply water, but they cleanse it. When water enters a wetland, the wetland becomes a giant kidney, filtering

[1041] Mitsch W, et al, "*The Value of Wetlands: Importance of Scale and Landscape Setting*." (http://directory.umm.ac.id/Data%20Elmu/jurnal/E/Ecological%20Economics/Vol35.Issue1.Oct2000/10911.pdf)

out impurities before allowing the water to leave. The wetland vegetation plays a large role in this filtering system as it uses its roots and stems to trap and gather sediments comprised of both chemicals and nutrients."[1042]

During September of 2009 and 2010, the author was invited by Jim Curotolo and Professor Keith Porter to visit the Lodge of Mr Curotolo located in Beaver Dams, New York State.

The author was invited to several discussions lead by Jim Curotolo, Coordinator of The Upper Susquehanna Coalition, which has a comprehensive wetland programme. During these meetings the importance of Wetlands was discussed. In addition Mr Curotolo discussed his work with both the Upper Susquehanna Coalition and The Wetland Trust

More Information can be found of the Upper Susquehanna Coalition :
(http://www.u-s-c.org/html/wetlandprogram.htm)

Jim Curtolo has also developed a Wetland Trust:
(http://www.thewetlandtrust.org/)

[1042] United States Environmental Protection Agency:
(http://www.epa.gov/bioiweb1/aquatic/importance.html)

The object of the Trust is to restore, preserve and protect Wetlands. It covers 110 acres in three locations in New York.

Wetlands are across the globe and are just as important in purifying the water in The United States as they are in Great Britain, and every other country with wetlands. Even countries without wetlands benefit from the various duties and processes, which are fulfilled by the wetlands.[1043]

[1043] For more information on Wetlands see; Finlayson M, " *Managing Wetland Ecosystems – Balancing the Water needs of ecosystems with those for people and agriculture*."
(http://www.inweh.unu.edu/drylands/docs/Publications/Water%20and%20Ecosystems_web_Part2.pdf)

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Web-pages

All Web-pages used are attached as footnotes in the body of the thesis.

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